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Editorial Notes

THESE Notes should deal with live issues, with policies of action and with ideas that are current amongst workers in the field of archaeology. The review-policy of ANTIQUITY is, therefore, a suitable subject for open discussion here.

We sometimes wonder whether the publication of about 20 pages of reviews in each number is justified, whether some of the labour thus involved is not wasted. Recently we took part in a most fruitful weekend discussion on this very subject, and some interesting conclusions emerged.

It was agreed by all that the reader wanted to be told what the book was about, and whether it was a ' good ' book. It was also agreed that, on the whole, it was better not to notice ' bad ' books. Obviously, however, not all ' good ' books can be reviewed, for, out of those received, some are severely technical—necessary to the specialist but unintelligible to others. Excavation reports do not as a rule come under this heading, for nearly all of them—and all the best—have some general bearing, and contain much that can be understood by any intelligent and well-informed person. As for ' bad ' books, there are times when notice should be taken of them to protect the public against plausible charlatans ; but more often the space thus occupied would be better filled by a notice of a ' good ' book. As a rule the exposure of charlatans is best left to themselves, and time.

Another interesting fact brought out by our discussion was that reviews, especially the best, often have a sterilizing effect. It is easy for a conscientious reviewer to embody in a review some idea or discovery of his own that should more properly be developed at greater length in the form of an article or book. To evade this is a temptation to a busy man ; for, by incorporating it briefly in a review, he patents his idea at the cost of the least trouble to himself. But if the idea is sound and really important, it deserves something better than to be thus prematurely born and forthwith, for all practical purposes, buried. Instances of this practice have been frequent in ANTIQUITY (the present writer is by no means guiltless). There may be cases where the practice is justified. Usually, however, a review should consist of information and criticism rather than of brilliant ideas.

Some change of policy is necessary if only on the grounds of space. Readers will have noticed that reviews are now printed in larger type. (In passing we may mention that this change was the direct result of a reader's criticism, for which we are duly grateful). But the pile of books awaiting attention grows steadily, and at the present rate prompt notice will become ever rarer, and many books will have to be consigned to the list of Books Received. (We take this opportunity of pointing out what must surely be obvious—that such brief mention is emphatically not in any way a condemnation. It simply means that, for one or other reason, the book in question cannot be reviewed in ANTIQUITY. Sometimes it is because the reviewer has failed to live up to his promise!).

In future it is hoped to publish more ' block reviews ' of several books that seem adapted for such treatment, rather in the style of other quarterlies (the *Quarterly Review*, for instance). The difficulty of carrying out this policy is, of course, to find someone to undertake the task. Experienced archaeologists are not too common in this country where the old book-learning still controls so many key-positions. In some spheres (such as that of Mesopotamia, for example) the number of potential reviewers, and even of writers of articles, is so small that each of them may receive several requests to review the same book. The labour of reviewing is considerable, and takes up time that should often be devoted to other work. Moreover, it is neither fair nor desirable (as a rule) that the same person should be expected to write several reviews of the same book.

Whether the change of policy here outlined will prove practicable is still uncertain. In any case it cannot come into effect at once, since there are still a number of reviews to work off. It will be our aim to produce this change, however, if we find it possible. Finally, we would ask those who are good enough to give us their help, to make their reviews as short as they can. The actual length must be left to reviewers themselves to decide ; and in so doing we would beg them *not* to look back (as some do) and find the *longest* review ever published, and then use it as a measure for their own, but rather to adopt a minimum length.

We referred above to the dearth of specialists in Middle Eastern archaeology. That is one of the causes of a weakness in the contents of ANTIQUITY. We are quite well aware that ANTIQUITY does not contain as much information as it should about the archaeology of the Middle East, but we hope that, if promises are fulfilled, several articles dealing with this part of the world will shortly appear. But in this country we are lamentably poor in workers in this field, and the dastardly and pointless murder of Mr Starkey has still further reduced their numbers. The consequence is that individuals are overworked, and it is not right to expect them to give to reviewing the time and energy that should go to research. (It would be interesting if figures could be compiled to compare the amount of money devoted to the endowment of field-work and research in, say, Palestine, Cyprus, Syria and Iraq by the different nations working there).

Amongst those workers are the inhabitants of the lands themselves. That is as it should be. Scientific archaeology was born in the North, and still maintains its lead there ; but science—true science—ignores national and racial frontiers, and the backward countries are waking up to the study of their own past. Egypt is beginning to produce its own archaeologists, one of whom will (we hope) shortly be introduced to our readers. Cypriote archaeology is at last being set in thorough order, thanks to the work of students of at least four different nationalities, and aided by the Government and by voluntary contributions. Much more might be done if more money were available, for the organization is all ready, and the workers are enthusiastic. The Nicosia Museum is served by a devoted staff. Its arrangement is admirable, and it needs only time and funds to become a model of its

kind. The work of the late Sir Themistocles Zammit in Malta is well known and justly admired throughout the archaeological world.

In all these matters the relative functions of the home authorities (which in practice usually means the Treasury), the local Government and the voluntary contributor (whether an individual or a corporation) are not always equally balanced. If it be admitted that certain activities, such as excavation, are the particular function of individuals and societies, it must also be pointed out that others, such as the conservation of antiquities, in museums and out-of-doors, must be the prime duty of the Government. A certain minimum of such conservation is incumbent upon all civilized Governments. Yet there are still regions where those minimum requirements have not yet been fulfilled. For the moment we do not propose to say more on this subject, in the hope that certain developments may take place.

Our twelfth volume begins with this number and we venture to remind our subscribers of the renewal of their subscription. Already many have been good enough to send it, and the use of Bank Orders is adopted by others—to all these our thanks are given. To those who so far have not done either we would say that payment before we have to send out ' reminders ' is very much appreciated and saves work in several ways. We shall be glad if they will find it convenient to make use of the form and envelope inserted in their December number.

In another way the help of our readers will be welcomed. We know that everywhere there must be potential subscribers who have not yet seen or even heard of ANTIQUITY (in spite of its world-wide circulation). We shall be glad to have the names and addresses (sent for convenience to 24 Parkend Road, Gloucester) of friends who they think would like to have particulars, which would be sent at once, and in special cases we are prepared to send a specimen copy.

Finally our thanks are once more expressed to all who enable ANTIQUITY to continue. We are much encouraged by the expressions of appreciation which show us that it is still received with unabated pleasure and interest.

The Burusho of Hunza

by E. O. Lorimer

THE small state of Hunza is the most northerly in British India. It consists for the most part of a close-packed mass of unscaled and unscalable mountain peaks over 20,000 feet, seamed by untrodden rivers of snow and ice ; as might be anticipated, it is mainly uninhabited. Its frontiers march with Afghanistan on the northwest and with Chinese Turkestan on the north and northeast. But where the Hunza river has cut its way down from the Pamirs to join the Gilgit river and ultimately the Indus, there remain, clinging to the mountain sides, a few sloping, rocky terraces which, if water can be brought to them, can with diligence be rendered fit for human habitation. These oases of green amidst the barren desolation of rock and cliff and mountain peak are the habitat of a sturdy mountain people, the Burusho, speaking a difficult but extremely interesting language, of so great antiquity that no affinity between it and any other known form of human speech has yet been traced by the comparative philologist.

When D.L. was posted as Political Agent, Gilgit (1920–24) he made it one of his leisure tasks to collect material for a scientific study of Burushaski (the language of the Burusho) the result of which is a three-volume work*—grammar, texts and vocabulary—of which the last volume is just issuing from the press. In 1934—ten years after his retirement—we returned unofficially to Hunza, armed indeed with a considerable knowledge of the language but with no facility in speaking it, to live amongst the peasants and make such a study of their customs, agriculture, economics, etc., as amateur anthropologists might.

During our four years in Gilgit we had not failed to discover that the Hunzukuts (dwellers in Hunza) were the most attractive of all the likable mountain peoples of the Gilgit Agency, the most physically prepossessing, the most intelligent and the most trustworthy. All classes in Hunza gave us a warm welcome, from the Mir—who has

* *The Burushaski Language*, by Lt.-Col. D. L. R. Lorimer, Oslo, 1935 (England: Williams and Norgate) published by the Norwegian Institute for Comparative Research in Human Culture.

ruled his country in the humanest and wisest of benevolent autocracies, since the treaty of 1892 placed him on the throne of his murdered father and parricide brother—to our humbler neighbours in Aliabad, the village four miles below the capital which we made our headquarters for fifteen months. As soon as the people grasped the purpose of our coming (which was not easy to explain to an illiterate people) they were overjoyed that a ' Sahib ' should trouble to learn their vernacular—a thing which no white man or woman had done before—and take an interest in their customs and hereditary lore. At first they would hesitate : ' but you have wheels (=machines) in England, and can do all these things better than we can '. Within a few days they were vying with each other in explaining, demonstrating and bringing ploughs, looms, winnowing forks, bows, stone cooking pots to the resthouse where we were installed, that D.L. might measure them and take ' studio portraits ' of them, ' for you mustn't put anything in the book about us that isn't exactly true '.

The entire life of the Hunzukuts is centred in water. The rainfall in the oasis level (7–9,000 feet), is negligible—we reckoned less than 2 inches per annum ; in default of any means of raising the water, the river, flowing between its crumbly earthen cliffs, 500 or 1,000 feet below their fields is useless for irrigation ; there are no springs or wells ; hence all water for all purposes must be trapped high up at the snout of some side glacier and conveyed on galleried aqueducts across yawning gorges and the faces of sheer cliffs. The main water channel, the Dala, which supplies all the more recent villages of Hunza, ' the new settlements ' as they are called in contradistinction to the three original villages—Baltit the capital, Altit and Ganesh—travels some 8 or 10 miles in its circuitous route from the Herber glacier in the gorge behind Baltit, cradled between snow-peaks of 23,000 feet, before it peters out in a semicircular sweep round Aliabad.

The Dala was dug some three or four generations ago (90–100 years) with wooden shovels and wooden picks tipped with ibex horn, and represents an amazing feat of engineering skill for people without any instruments of precision. The sluices that control the distribution of water—every teaspoonful of which is rigorously allotted—are of the simplest ; most often a slab of flattish stone plastered in with mud, sometimes a wooden shutter sliding in a rude wooden frame, sometimes when the water is being taken off to a lower level a circular hole in a stone slab, closed at need with a mushroom-shaped stopper, rough hewn from a solid tree trunk.

The Hunza dwelling house is a fortress-like cube of stone and mud whose front door is screened from the hostile outer air by a barn,

the door of which is strategically placed at right angles to, and some distance from, the main door. The only ventilation is the central smoke-hole of highly elaborate construction, three wooden frames

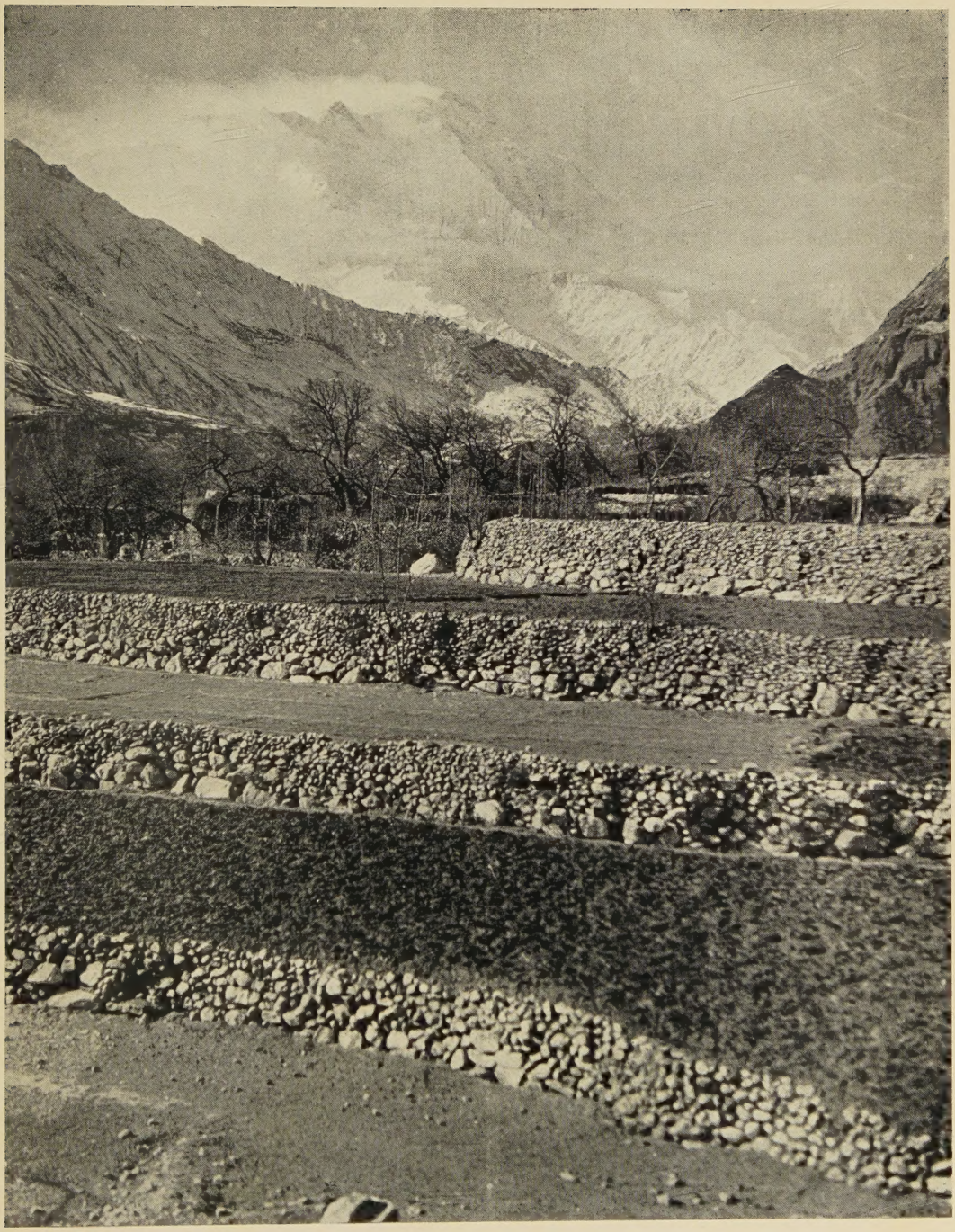
diagonally superimposed on each other, exactly duplicating some of the ancient smoke-holes recently unearthed in Central Asia by Le Coq. A large store-room about 6 feet deep runs the full width and height of the house and is entered by a door at the back of the central atrium. It is provided with a minute, unglazed, shuttered window, the only ' window ' known in Hunza except in the houses of the Mir and the Wazir. The furnishings of the living room are simple but adequate. Two large sleeping benches, some 7 feet wide and 9 feet long, flank the side walls, and are raised 18 inches or so above the floor. The sleepers roll themselves in homespun blankets or padded quilts and sleep crosswise on the bench like parallel sausage rolls. One bench is reserved for men and the other for women. The hearth occupies the centre of the floor and is outlined by four stone kerbs. The sleeping benches, which serve by day as sitting places, are screened at head and foot by capacious cupboards, one of which serves the mistress of the house for her kneading trough and other utensils, another takes the form of a large bin with sub-divisions to hold the current supply of flour.

The normal cooking pots and oil vessels, lamp cruses, etc., are of hollowed soap-stone, often of gracefully irregular shape, reflecting that of the boulder from which they have been hewn. Gourds furnish the usual ' jugs ', and wooden bowls, nowadays frequently turned on a lathe, the eating vessels. Wooden spoons and ladles are cut in one piece, the handles being formed by a convenient branch or twig. The delightful result is that no two pots, bowls, or spoons, are identical in size or shape. Unfortunately aluminium or enamelled iron vessels and galvanized buckets are finding their way into the country. We ourselves were, I fear, guilty of adding to their number and even introducing a few multi-service kerosene tins.

The greater number of field implements are still of wood, though the ploughshares are now usually shod with an iron shoe or tip, and a lucky family may have acquired an iron spade or hoe or a five-pronged iron fork. A small community of ultimately Indian origin, the Béricho, lives amongst the Burusho and supplies the music for their polo and dancing and the blacksmithery of their simple ironwork : the shears, the rude sickle, the sharpened scrap of iron that serves as razor.

The sharpened stone or ibex horn, which till very recently served for all necessary carpentry, is now replaced by the iron-headed adze which hacks out the steps on the log ladder and shapes the narrow planks for doors and cupboards. The true Hunza door consists of a set of

PLATE I

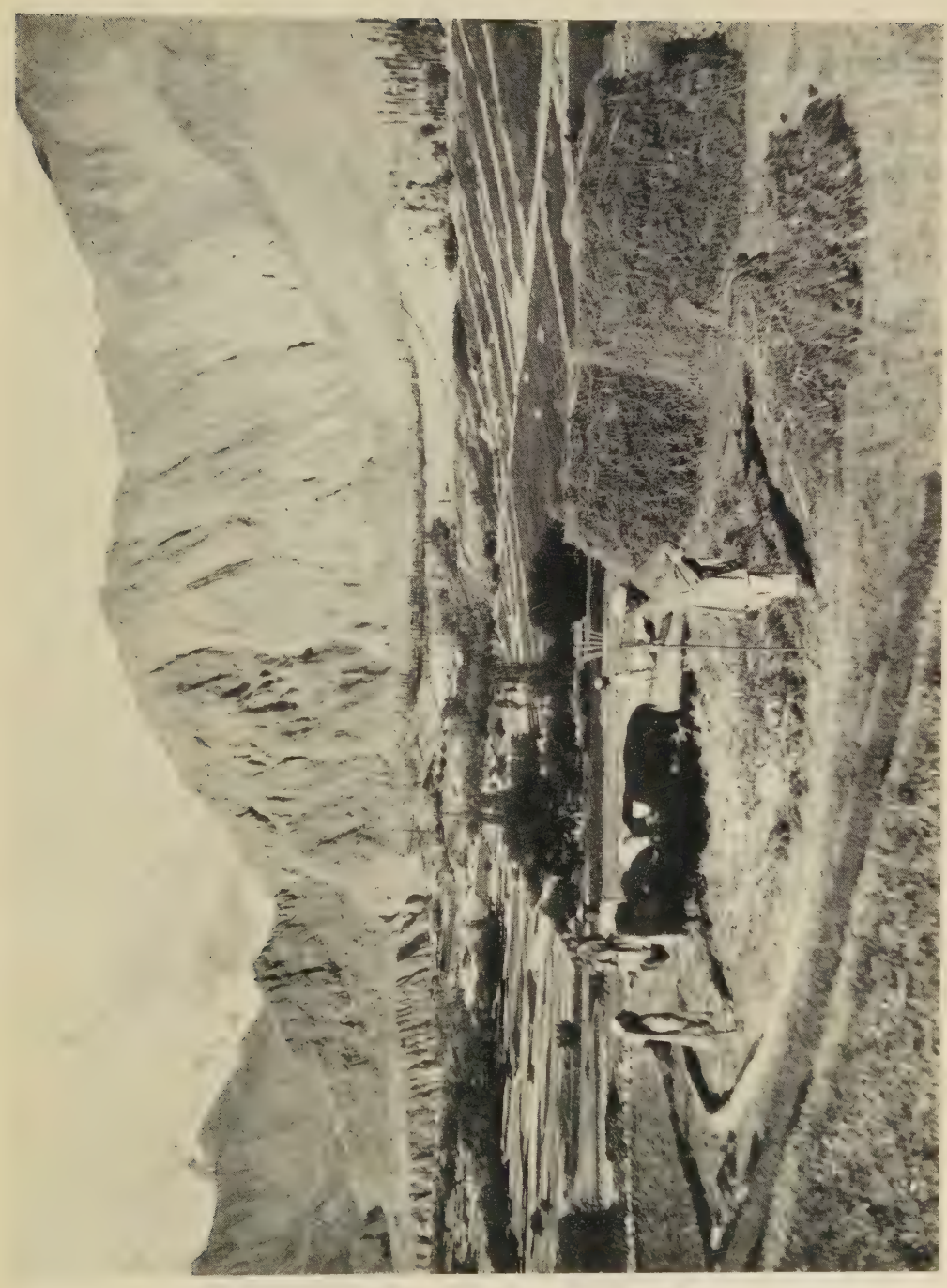


TERRACED FIELDS, HUNZA
pls. I–IV, *ph.* E. O. Lorimer

facing p. 8

PLATE II

THE BASKET-MAKER, HUNZA (*see* p. 9)



PREPARING THE THRESHING FLOOR, HUNZA (*see* p. 12)
(note the pronged fork in the man's hand)

A PRIMITIVE LATHE: THE MAN FOR WHOM THE BOWL IS BEING MADE SITS IN A PIT AND SUPPLIES THE POWER WITH TWO TREADLES (*see* p. 14)

PLATE IV

these narrow planks placed side by side and pierced by horizontal holes through which two parallel rods are threaded ; the hinge is a longer piece of wood pointed at both ends and rotating into holes in threshold and lintel ; while the whole is secured by an ingenious wooden lock. Most villages, however, now possess a carpenter or two, trained in the P.W.D. workshop at Gilgit and armed with plane and saw, who can produce more Europeanized doors and cupboards, to the greater comfort of their owners and the selfish regret of the anthropologist. The old, home-made door is still in use for barn and byre.

Every peasant family is almost entirely self-supporting and independent, eating the produce of its own laboriously and beautifully terraced fields (PLATE I), wearing the woollen cloaks and caps spun and woven from the wool of its own sheep, and booted from the skin of its own beasts. The only foreign garments worn are the cotton shirts and trousers of comparatively recent introduction, now considered indispensable by both sexes, and the merry little cotton caps, plain or silk-embroidered, which have replaced the heavy woollen salvation-army bonnet of the women. Butter is made and water carried in skins ; grain and flour are carried in skin-bags or sacks and stored in skin-sacks or wooden bins. Rugs, saddlebags and ropes are woven of goat's hair.

In a country where no unirrigated tree can grow, timber is very scarce. An old apricot or appletree is sometimes available, or the root of an old vine, otherwise the only general timber is the poplar, grown primarily for poles and rafters, and the willow, absolutely essential for baskets (PLATE II), a dozen varieties of which are needed for carrying apricots, manure, dry leaves, straw etc., and for storing potatoes and dried fruit.

The soil of Hunza is unimaginably poor, consisting in fact of little but powdered-up mountain side. The scarcity of water means also the non-existence of pasture, and the few animals that can be fed eke out a spartan existence on the scraps of grass growing on the rare semi-irrigated strips of hillside or beside the water-channels, and on such weeds amongst the growing crops as are not earmarked for human consumption or remain after the crops have been reaped. This scanty provision is supplemented by the autumn harvest of dry leaves (not one of which lies on the ground ungarnered), the straw and stubble, and occasionally a small quantity of dried grass. Only a few families command enough land and water to grow a little lucerne for fodder. The most livestock that the average household of 10 to 20 persons

hopes to possess is a tiny flock of 20 to 25 sheep, goats and cows. In these circumstances manure is more precious than gold, and the small children who conduct a cow to pasture carry a shoulder basket in which every ounce of the day's output is scrupulously collected and brought home.

When the snow retreats on the upper mountains a few patches of green are left here and there, and the more athletic beasts are taken up by young men who live in shelters with their charges, collect the manure, convert the milk into butter and bring these home with the animals when the snows claim their own again. These patches of high pasture, several thousand feet above the villages, are all too few and can only be reached by serious feats of mountaineering. Through field-glasses we could see the grazing animals clinging—by their eyebrows as it seemed—to their precipitous ' summer pastures ', but it was impossible to ride up even on a yak, and at our age impossible to climb on foot for a nearer view.

As soon as the trees put out their leaves in spring, each ' donkey tree ' (*i.e.*, non-fruit-bearing) is stripped of every scrap of spare foliage to feed the half-starved beasts. This luxury diet has to be very carefully administered lest the animals should perish of its unaccustomed succulence.

The major crops grown by the Hunza people for their own use are wheat, barley, several kinds of millet, sweet and bitter buckwheat, nowadays also the highly-valued potato (introduced by the British in 1892) and small quantities of various pulses. Barley must have been the original staple crop, for all the traditional festivals, the Seed-sowing of early spring, the First Reaping of early summer and the Harvest Home, relate to barley alone. The peasant is wise about rotation of crops and the various types of wheat, millet, etc., which thrive best in given conditions. Wheaten bread is much preferred to any other, but barley remains the larger crop because spring-sown barley ripens three or four weeks before even the winter-sown wheat, and the vacant fields can be resown with millet ; whereas after the wheat only buckwheat can hope to ripen before winter. Bitter buckwheat is frankly detested, but it is hardier than the sweet and can better withstand an attack of early frost, so a certain amount of it is always sown as an insurance.

So poor is the soil, so scanty the manure, that in the newer villages like Aliabad, the average return is only sevenfold and even the storeyed fields of Baltit, which have been tilled in the sweat of man and woman's brow for at least 600 years and probably for twice or thrice as long, yield

a miserable ten—none of your ' some thirty, some sixty, some an hundredfold '—while lucerne only gives three crops.

The Hunzukuts' main food is bread, of which the housewife makes a large variety, from the leavened wheatened cake with butter for feast days, the unleavened flapjack of wheat, barley or blended flours for everyday, to the bitter buckwheat scones of leaner times. Milk is not an article of diet; the animals yield little at the best and none at all when their own offspring is weaned. Such milk as there is contains little fat content, which is not to be wondered at in view of the food on which the animals exist ; it is converted into butter, curds and such preservable forms. Butter is stored in birch-bark wrappings beneath an adjacent water-channel and broached only on festive occasions or for the entertainment of a guest. Meat is tasted at most twice or three times a year, at festivals or on some day of domestic rejoicing, a wedding or a birth, and then it will be ' some tainted wether of the flock, meetest for death ', who supplies the sacrifice.

The womenfolk tend small vegetable plots in the corner of a field or separate garden, where carrots, turnips, marrows, gourds and half a hundred kinds of humble ' greens ' are grown, and a few plants whose leaves or seeds are esteemed for flavouring, along with a few tobacco plants for the men's pipes. After grain and greens, the essential item of Hunza diet is the apricot, fresh in the early summer and dried during the rest of the year ; mulberries, fresh and dried, come next in importance, then a few apples, pears and peaches (these little valued because they will neither keep nor dry) and a few grapes for such relatively well-to-do houses as can afford space and water to grow them. Grapes ripen too late to be dried into raisins and the small quantity not consumed fresh is converted into light wine, brightening the winter days for those who have it, and drunk within a couple of months of manufacture. The apricot has yet further uses. Its kernel yields the oil which lights very modestly the winter nights. The Burusho woman is said to refuse, most wisely, to live above the level of the ripe apricot (say 9–10,000 feet). This is, I suspect only a base pretext of her husband's for refusing to live at these altitudes himself. Be that as it may, the upper villages of Hunza are almost exclusively inhabited by immigrants from Wakhan accustomed to a treeless existence and a diet of barley only. Grafting fruit trees is an art thoroughly understood. The above-mentioned fruits supply the only sugar which the Hunza people know.

Despite all diligence in tilling the ungrateful soil, despite the utmost

care in rationing the year's supply (rationing begins the moment the first barley crop is harvested), scarcely a household we knew but was out of flour and out of potatoes weeks before the first barley was ripe, and was living solely on turnip tops, greens and edible weeds. ' Starvation Springtime ' in Hunza evokes no poet's raptures, only a wailing of hungry babies who, as their mothers apologetically explain ' are too small to understand ', and a tightening of the belt by those who do; but never a complaint. How these hardy people exist and work and smile—and keep on smiling—on a diet which no Minister of Health would consider even 50 per cent. adequate in quantity or 10 per cent. adequate in proteins, is a mystery, and must represent a miracle of natural selection over centuries. There are no sick or ailing in Hunza ; men, women and children are wiry, tough and fit, and a fair proportion live to a ripe and honoured age, busy to the last about such tasks as suit their waning strength and valued for their experienced counsel, for no devilish inventions—cinemas, wireless or machines—have created a gulf between the generations.

Harvesting processes are extremely simple. When barley or wheat is ripe, the adults of the family turn out and pull up the shallow-rooted crop by hand, laying the swathes in neat rows to dry. Even when a sickle is used, it is used to pull with, not to cut. As soon as a suitable field is bare, it is flooded, and a circular (more rarely a rectangular) space is enclosed by a small mud wall four or five inches high. When the ground is soft but no longer wet, the whole family, down to the tiniest toddler, forms in line and marks time systematically over the surface to level it. After three floodings and tramplings the new threshing floor is as smooth and even as a hard tennis court. Two neighbouring houses sometimes share a threshing floor which becomes the focus of family activity till the last sheaf is gathered in. The cut crops are stacked conveniently near, and a small quantity of corn is spread on the centre of the floor. Then while Grandfather with his beautifully graceful five-pronged fork throws in more grain from time to time, the team of five cows, loosely lashed together by their muzzles, is driven round by man, woman, boy or girl in turns until the threshing is complete (PLATE III). The person in attendance on the trampling beasts has a switch in the right hand and in the left a wooden bowl as ' dung-dish ' in which all excreta of either type are conscientiously collected, not only because the Hunza folk cannot afford to waste an ounce of manure but equally because they are too fastidious to tolerate the fouling of their food. Great was the contempt of our Hunza

companions who came down with us to Kashmir to observe peasants ploughing with *oxen* (whose wants could be less completely met) and without a dung dish !

When the corn is fully threshed, the winnowing begins in cooperation with a light breeze. Next the winnowed grain is passed through a coarse sieve (barakbèsh) whose mesh is composed of thin leather thongs which retain any particles of straw, and it is finally tossed in a finer sieve (gherbèl) which retains the grain and lets the dust through. The grain is then loaded into great skin-sacks and carried off to store. The due amount required for seed-grain is set aside first, and not the utmost extremity of hunger would induce a Hunza peasant to encroach thereon. Next, emergencies are budgeted for—births, weddings, dues such as rent (if any) and hospitality, which includes deaths in *other* homes, for relatives and friends would be disgraced if a bereaved family had themselves to bake during the first seven days of mourning. What then remains, represents the year's supply.

Ripe millet is treated by being beheaded, and the ears may then be threshed by cows or beaten with poles according to quantity. The buckwheats are beaten only, even small children merrily cooperating half in fun, half in earnest to show their prowess.

Grain for current use is carried to the mill in sacks or bags of skin. The mill-house is a picturesque cube of stone and mud situated beside a convenient irrigation channel. It may possess one wheel or two. The wheel is a vertical oblong of tree trunk, fitted with 10 or 12 wooden wings ; the lower end of its axis is supported on a horizontal pole, the upper fitted into a central hole in the upper millstone. The water is led on to it by a steeply sloping hollowed log. The inside of the mill, lighted only from the door, is fitted with a cross rafter built into the walls on to which the hopper is ingeniously hung by a forked segment of tree. The hopper itself consists of a section of log, tapered and hollowed out. Attached by a string to the small tray below the aperture in the base of the hopper, is a loose clapper which is gently agitated by the rotation of the upper millstone on which it rests, this shakes the tray and encourages a steady flow of grain. The flour as ground is ejected into a hollow trough. Near by, a wooden pole, impaled on a horizontal wooden pin, projects up through the earthen floor. Each end of the pin rests on a 'Heath-Robinson' pile of stones and a simple adjustment of its height regulates the position of the lower millstone and thus the coarseness or fineness of the flour desired. The mill, the loom and the comparatively new-fangled lathe are the only

' machines ' known in Hunza, and the mechanism of all three is so simple that parts can be replaced, repairs or adjustments effected, by any intelligent child—and we met no *un*intelligent Hunza child.

Anyone desirous of doing so can acquire a weaver's skill, and in our village of some 200 families there were seven or eight expert weavers. The loom-pit is a hole in the ground, 2 feet wide and deep and 2 feet 4 inches from back to front, with a stone bench at the back. Two horizontal poles balanced on stones a couple of feet above the ground at either side carry the heddles, etc. Here the weaver sets up his home-made loom of ingeniously simple construction worked by four treadles in the bottom of his pit. While he works, the owners of the wool sit by and wind his bobbins. A skilful weaver can make the nine yards of narrow homespun required for a man's cloak in a day and a half. The loom-pit occupies fully half the width of the ' street ' and when being used forms the centre of a shifting group of cheerfully gossiping passers-by.

Goat's hair is woven on an even simpler upright frame, a forked piece of tree supplying the single shed required.

Turning is a rarer accomplishment than weaving, and our village boasted only one lathe-master. Like the loom the lathe is set up in a pit. The person desiring a bowl supplies the necessary rough-hewn block of wood (apricot or vine root preferred) and the motive power required to turn the horizontal bar, on to one end of which the wood is spiked. The turner crouches alongside with a selection of small curved chisels which he rests on an adjustable tripod to steady his hand (PLATE IV).

There is no room to tell of all the simple yet ingenious household utensils which the Hunzukuts conjure from the scanty resources at their disposal : the spliced wooden bow faced with plates of ibex horn and beautifully curved ; the boys' catapult bow with double string of horse sinew, for scaring birds ; the double-chambered wool-container made of rowan bark ; the small vessel like an ash-tray which steadies the woman's rotating spindle and is moulded from the refuse of the apricot kernels left after the oil has been expressed. Not a shred of anything is wasted in Hunza. What cannot be eaten or turned to use—even the shell of the apricot kernel—is gratefully seized on as fuel for the pitifully small fire that cooks the bread and vegetables. Fires for mere heating are an undreamt of luxury. Hence the draught-proof house is essential, for at 7–8,000 feet, with snow mountains all round and a temperature of 19° Fahrenheit, the ' Great Cold ' is

sufficiently severe. Happily winter is short, two or three months at most, and for the rest of the year day and night are spent mainly out of doors.

The social culture of the Burusho of Hunza is as high as their material culture is primitive. Three centuries of Islam—they are now Ismaili heretics, having been Shiahs until three or four generations ago—have not induced them to veil or despise their indomitable women, nor to abandon the wholesome tradition of exogamy between their different clans in favour of first-cousin marriage. They are freer from superstition and fanaticism than any people east or west of whom I have heard or read. Whatever be the esoteric teaching of the Ismailis of which Professor Ivanov might tell, it concerns the Hunza peasant as little as the homoousian controversy disturbs the mind of the British schoolboy. He goes his way in cheerful confidence that hard work, fair dealing, kindly affection and generosity must be as well pleasing to God the Merciful, the Compassionate, as ritual prayer or ceremonial fast, and his dreams are not broken by over-anxious fear of Hell or hope of Heaven.

The fastidiousness and personal cleanliness of the Hunza peasant are remarkable. Close packed amongst the crowd at festivals or sitting on the threshing floor amongst the workers, or entertained in their hospitable houses, we were never distressed by human exhalations or molested by parasites. The drinking water is guarded with scrupulous care from pollution by man or beast. Men and women cooperate without embarrassment or restraint and no work is taboo for either sex, though for obvious reasons the heavier jobs of wall-building, irrigation and ploughing fall more naturally to the man, and the care of infants to the woman. But as soon as the father is allowed to handle his child, he will carry the baby proudly and tenderly out for its first airings, while boys and girls alike play with and watch over the toddlers.

Again and again, in face of the high morality and unquenchable spirit of the Hunzukuts, we were ashamed to think of what in our vaunted civilization ' man has made of man '.

Verulamium

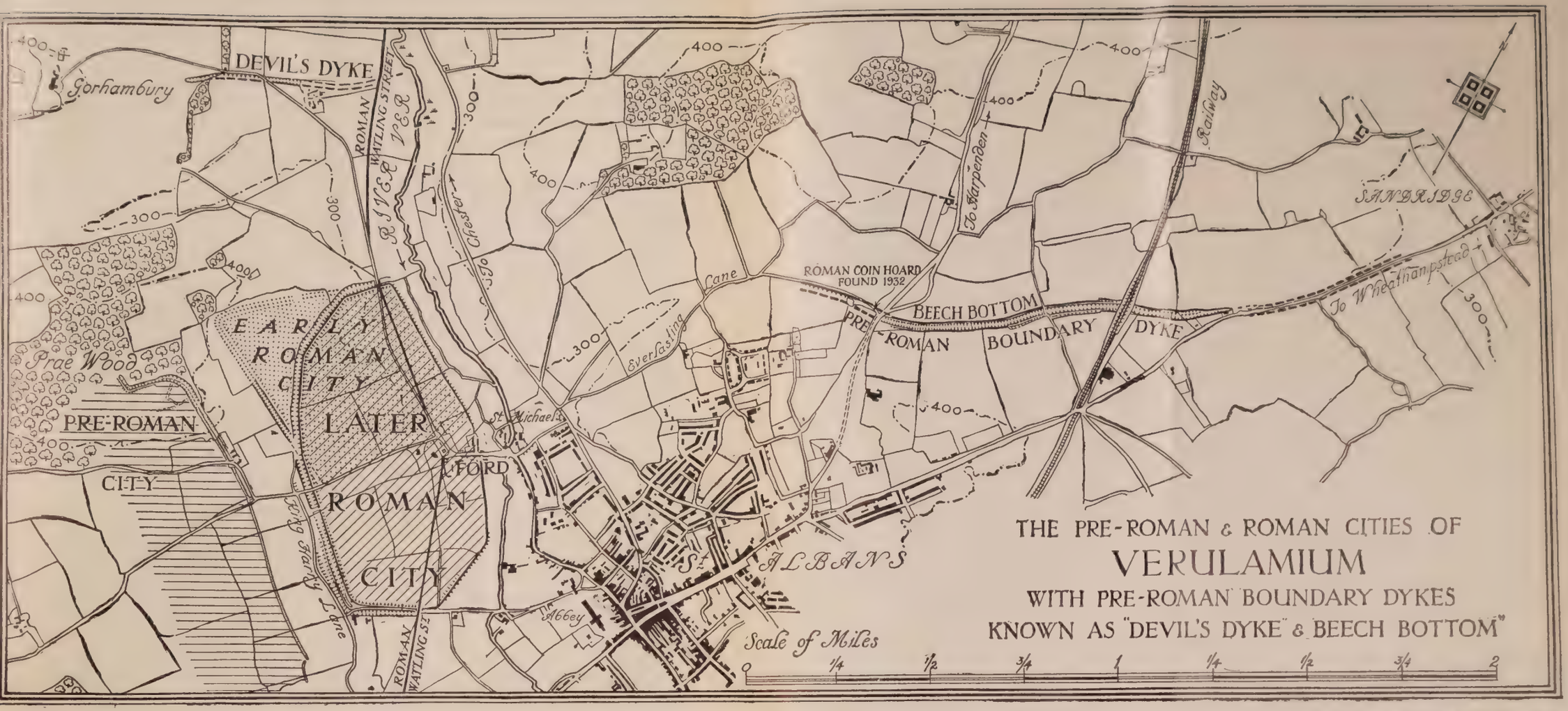
by J. N. L. Myres

Verulamium : A Belgic and Two Roman Cities. By R. E. M. and T. V. Wheeler. Reports of the Research Committee of the Society of Antiquaries of London, No. xi. 1936, pp. xii, 244, with 120 plates and 49 text-figures. 15*s*.

THIS splendid volume contains the definitive record of the excavations carried out by Dr and Mrs Wheeler at Verulamium between 1930 and 1934, and it was complete in every essential save publication at the time of Mrs Wheeler's death in April 1936. It forms the final monument of an archaeological partnership which had astonishingly developed the technique of large-scale excavation on Roman sites in this country in a series of operations whose major landmarks were at Carnarvon, Brecon, Caerleon, and Lydney; excavations distinguished from others of their kind not so much perhaps by the technical skill of their direction, though in this matter too they have been second to none, as by their pre-eminent excellence as training schools of archaeological method to the students who flocked to them, and as aids to right thinking by the ever-widening archaeological public which they did so much to create. Mrs Wheeler has her memorial in many places : publicly in the London Institute of Archaeology and privately in the hearts of all who knew her ; but many will think of this volume as peculiarly instinct with her genius, for every page of it bears witness to the comprehensiveness of her organization, the discipline of her energy, the patience of her leadership, and the vital sureness of her touch. *Non extinguetur in nocte lucerna eius.*

So much publicity was accorded to the achievements of the Verulamium excavations as they progressed that there is no need to recount in detail the results as recorded in this report.[1] It contains indeed no surprises. We are led by easy stages from the Belgic *oppidum* at Wheathampstead, discovered as a by-product of these excavations, and now saluted as the best available claimant to be the stronghold from which Julius Caesar drove Cassivellaunus in 54 B.C.,

[1] See, for example, Antiquity 1933, vi, 133–47 ; 1934, vii, 21–35.



By courtesy of the Society of Antiquaries of London.

facing p. 16

to the later Belgic earthworks of Prae Wood on the hillside above the first Roman city, and thence *via* the first city, whose ramparts may have been erected after Boudicca's sack in A.D. 61, to the later city partially overlapping it. Here the second century defences with their monumental gates, the triumphal arch, the unique triangular temple, and the houses and shops of the *insulae* explored in the southern part of the town are described with an admirable blend of terseness and lucidity, and, for completeness sake, a brief account of the theatre and adjacent temple, already fully published elsewhere,[2] is added. The whole is illustrated with plans and photographs whose technical skill and artistic excellence are beyond all praise.

We have thus, in the main story of the creation and decay of one of the greatest cities in the northern provinces of the Roman Empire, a cross-section, as it were, of urban life through three and a half of the most crowded and controversial centuries in the history of Britain. The chief impression which this story must leave on the reader is one of astonishment at the accuracy with which it reflects the general economic trend of those centuries as known from the historical sources for the age. Verulamium, with its movement down the hillside from squalid pre-Roman beginnings to sporadic ribbon development along the Watling Street ; with its magnificent second century expansion marked by the splendid defences and public buildings of the golden age of Hadrian and Antoninus Pius ; with its utter economic collapse in the third century when its ruinous aspect must have ' borne some resemblance to a bombarded city ' (p. 28) ; with its brave but futile rehabilitation in the Constantinian age, its rapid subsequent decline, shown by the shrinkage of the dwindling population towards its central area, and its final extinction in Saxon times, seems not so much to epitomize as almost to caricature by over-emphasis the salient features of urban history in the western Roman Empire.

But if the outlines of Verulamium's history are now clear and conform in the main to the pattern which we should expect, there remain many points which will have to be cleared up before the tale is complete or indeed really intelligible as a piece of local history. Five seasons' work conducted even on the scale of Dr and Mrs Wheeler's excavations, and even allowing for their masterly selection of informative spots for examination, has not been enough to probe the secrets of so huge a site or to answer all the questions which leap to the mind on

[2] *Archaeologia*, LXXXIV, 213–61.

the perusal of this report. Belgic Verulamium, for example. We have it on the best authority that a city set on a hill cannot be hid, but it must be admitted that Dr Wheeler's ' Belgic city ' on the hill above Verulamium remains after all his efforts a somewhat clandestine affair. Are we really to believe that this unimpressive group of earthworks in Prae Wood with its shadowy continuation to the south, with not a single identifiable hut-site and no intelligible western boundary was by itself the centre of Tasciovanus' power, the seat of a Belgic empire soon to dominate all southeastern Britain? Of two things at least we may be certain : his palace was not there and his mint was not there ; had they been, we can be sure that Dr Wheeler would have found them.

Even the ascription of the Prae Wood occupation to so early a date as the time of Tasciovanus (the turn of the first centuries before and after Christ) would appear on close inspection of the evidence to be rather precariously founded. It is based in the last resort on the absence of Italic and south-Gaulish fabrics among the small group of sherds—parts of only twenty-five vessels—occurring in the primary silt of the main dyke, and while the extreme danger of arguing negatively from so small a group is rightly emphasized by Dr Wheeler on pp. 44–45, this proper caution has disappeared on page 46 where we find that ' in summary . . . the ceramic evidence converges upon a date at the end of the first century B.C. for the Belgic earthworks in their original form '. The character of the later Belgic deposits in these ditches seems to be responsible for this change of emphasis ; they are dated by Dr Wheeler (p. 45) ' with fair certainty to A.D. 10–35 '. Both these dates are really arbitrary : in particular there would seem no valid reason for fixing the lower limit precisely at A.D. 35, and if someone was to urge that this deposit could with equal plausibility be dated A.D. 25 to 43, it would be very rash, with our present knowledge of Belgic ceramics, to deny the possibility that he was right. If so, however, the primary period for the preceding earthworks may be as late as A.D. 25, and their association with Tasciovanus who, on Dr Wheeler's chronology, died about A.D. 10 (p. 7) becomes perhaps rather possible than probable. But whatever date we choose for their construction, it is difficult to regard Dr Wheeler's use of the word ' city ' for the Prae Wood ditches as anything but a misnomer, nor, if this really was the whole ' city ', is it easy to understand the early grant of municipal status to its Romanized successor.

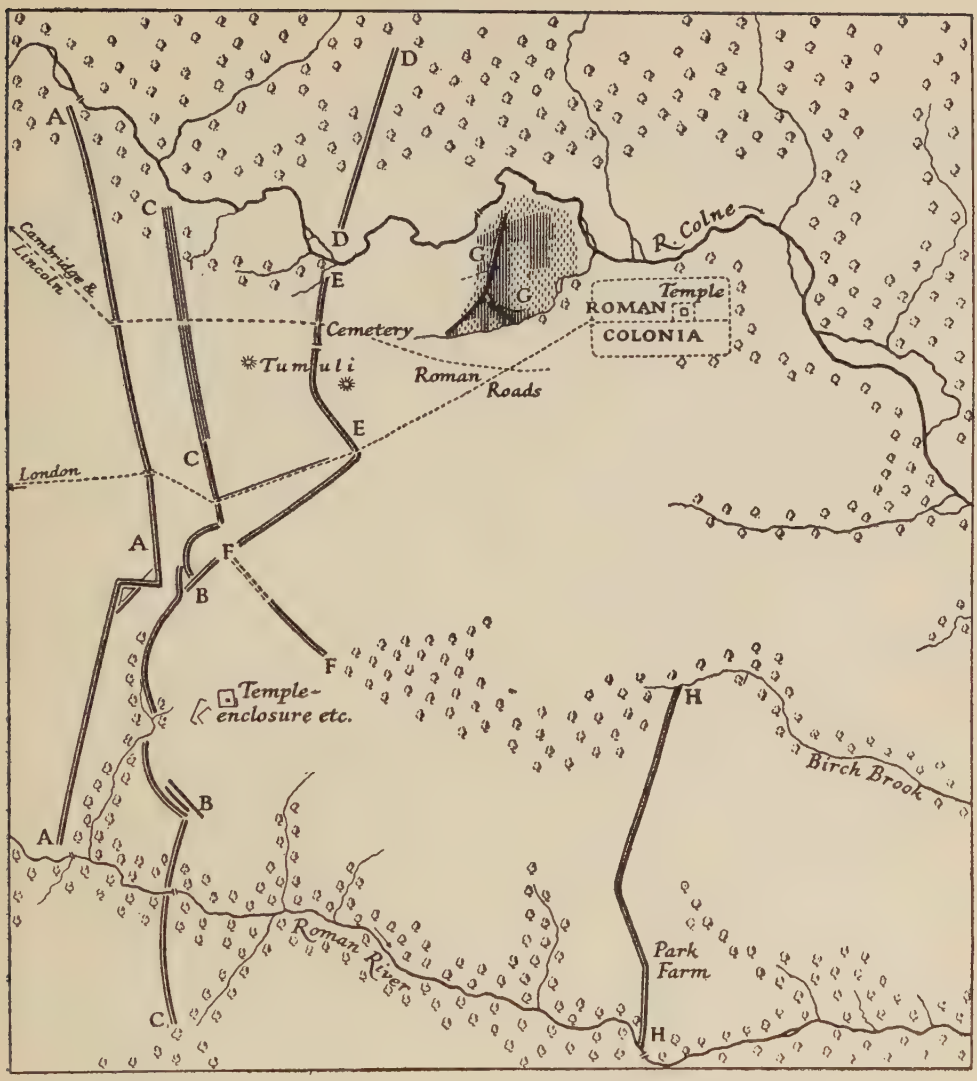
Now if we ask ourselves what a ' Belgic city ' was like in the first half of the first century A.D. in Britain, there is one good example to

guide us—Camulodunum, the capital of Cunobelinus, and the immediate successor to Verulamium as the centre of the Belgic power. This appears to have consisted, as the recent excavations and surface fieldwork have shown, of a large central nucleus of solidly massed huts, pits, and ditches originally protected by a great dyke (G–G on the plan, p. 21) which was totally obliterated soon after the Roman Conquest.[3] This nucleus was surrounded by a wide area of country itself demarcated and enclosed by several more extensive lines of travelling earthworks, and probably containing a number of less important and satellite *kraals*. Now while it is true that at Colchester, as at Verulamium, excavation has not yet struck either the king's palace or his mint, the Colchester complex has at least a recognizable and thickly populated centre, in some part of which they presumably lie. But Belgic Verulam, as revealed by Dr Wheeler, has no such centre, for by no stretch of imagination can the Prae Wood ditches be equated with the dense occupation on the Sheepen Farm site at Colchester. Is Prae Wood, perhaps, only an outlying element of a once larger whole ? and, if so, where can we look for other and more central elements of it ? No suggestion of course can be other than a guess to be proved or disproved by the spade : but a glance at Dr Wheeler's plans will reveal one obviously possible area which his operations never touched. While he was at some pains to date the Fosse earthwork which bounded the ' early Roman city ' on the west and north, and has tied it down closely to the years following Boudicca's revolt in A.D. 61, the area which it enclosed, though optimistically labelled ' early Roman city ' on his plans, remains a complete blank in which not even a trial trench has been dug. Until we know something about the interior of this ' early Roman city ' it can hardly be said that the hopes of finding a central nucleus for Belgic Verulamium have been exhausted ; and it may be worth noting not only that Belgic pottery in considerable quantities occurred in all Dr Wheeler's sections of the Fosse, but also that, of the eight Belgic coins found during the excavations, no fewer than five came from the ' early Roman city ' while only one turned up in Prae Wood. On the present evidence, in fact, we are bound to regard the possibility that the main Belgic occupation and the first Roman city overlapped or coincided on the ground as still an entirely open question.

[3] I have to thank Mr C. F. C. Hawkes both for information on several features of the Colchester complex, and for the plan (p. 21) which he has drawn to illustrate them. He is in no way responsible for the use which I have made of this information.

It may perhaps be added that on general considerations it would not be at all odd if the earliest Roman occupation was in fact a continuous and haphazard development of the central Belgic *kraals* ; nor need we be surprised at the apparent absence of pre-Roman defences for this central area. At Colchester, too, there was no apparent sign of the innermost line of Belgic dykes before the excavations of 1930 began, and so effectively had they been slighted after the Roman conquest that it took two seasons' work before their true course and nature were understood. If a similar slighting occurred at Verulam we should expect as little trace of the earlier defences now as there was at Colchester before 1930, and the first settlers on the site after the Roman conquest may well have remained entirely unprotected until after the unhappy experience of Boudicca's rebellion. But if the site itself remained the same before and after A.D. 43 it would explain far more easily than the sequence suggested by Dr Wheeler the early grant of municipal status to a Verulamium which showed a real continuity with the native past. It would also provide not only an interesting parallel to the probably continuous evolution into Roman towns of some other Belgic centres like Silchester or Winchester, but also a further illustration of that delayed action in the establishment of deliberately planned Roman cities which Dr Wheeler's own work at Maiden Castle has so recently demonstrated. All this, however, must remain for the present mere speculation. Until the ' early Roman city ' at Verulamium has been explored our knowledge of the transition from Belgic to Roman conditions there must necessarily remain inadequate. And it is with something of a jolt that we remind ourselves that the definitive settlement of this problem was to have been one of the main purposes of Dr Wheeler's work.

When we reach the second Roman city we can be whole-heartedly grateful for the brilliant excavation, description and illustration of the defences and of some eleven acres of buildings in the interior. The picture here provided of the rise and fall of civic life in southern Britain is vivid, convincing and indispensable, and the sidelights on local conditions supplied by, for example, the unusual building with a cellar, the votive deposits in the triangular temple, and the grisly remains of a sausage factory, will give food for thought to specialist and amateur alike. The discussion of the dated mosaics and their coloured reproduction—Mrs Wheeler's superb stone-for-stone painting of the horned sea-god (p. 144) throws a fresh light on the versatility of her accomplishments—breaks fresh ground in a subject which, for all its



AAA *Grymes Dyke*

BB *Contour Dyke*

CCC *Triple Dyke and rest of extensions of* BB

DD *Moat Farm Dyke*

EE *Lexden Dyke*

FF *Extensions of* EE

GG *Sheepen Dyke and excavated 'Inner Camulodunum' site*

HH *Berechurch Dyke*

'Inner Camulodunum' area ... *excavated* ▥ *unexcavated* ▨

ditch / bank *Dykes* ..... *Roman Roads*

1 kilometre *1 mile*

GENERAL PLAN OF BELGIC COLCHESTER

familiarity to Romano–British students, has long been crying out for scientific analysis. Dr Wheeler makes an overwhelming case for placing the construction of the defences in the second century ; it must however be said that the Hadrianic date which he presses seems hardly warranted by the evidence which he gives. Almost all the material for fixing it comes from deposits which only provide a *terminus post quem*, and while the bulk of these deposits may be at latest Hadrianic they do include a few pieces which could be later ; notably a Samian fragment by CINNAMUS (p. 58) dated by Dr F. Oswald between 130 and 150. How long after this the pot to which it belonged may have been broken and its fragments scattered, it is of course impossible to say. On the other hand there is really no close evidence for a *terminus ante quem* at all, except that a repair in one of the gates had already been executed before a coin of Lucilla (147–183) had gone out of use (p. 72). This really tells us nothing, and a date about the middle of the century for the whole system would seem to strain the probabilities less than Dr Wheeler's preference for the reign of Hadrian. This too would fit better with the dating of some elements in the contemporary internal reconstruction of the town. Here and there, indeed, the report provides evidence for a reluctant surrender by the authors of a Hadrianic date for some of these buildings in the course of its preparation. Thus the plan of Building III, 1 (p. 90, drawn in 1931) dates its first phase to the first half of the second century, while the text (*ibid.* presumably written four years later), assigns it ' a constructional date not earlier than *c.* A.D. 150 '. Here it is only the accidental occurrence of a piece of cut-glass Samian among material otherwise mainly Hadrianic or earlier which has forced the acceptance of the later date. One is left with the uneasy feeling that Dr Wheeler's Hadrianic date for the walls may depend simply on the accidental absence of similar shards in his sections across the defences and the gates. A very close parallel might be quoted from the Aldborough (Isurium Brigantum) excavations of 1935. There too a Hadrianic date for the walls at first seemed certain from the underlying deposits which were predominantly Trajanic and earlier ; but the presence of two or three possibly Antonine shards (including, as here, one of CINNAMUS) has convinced the excavators that the defences of Isurium cannot be safely dated before the reign of Pius.[4]

When we turn to the end of Verulam's story, the report bristles with

[4] Report shortly to be published in the *Yorks. Arch. Journal.*

unsolved problems. In spite of the documentary evidence for the survival of the city in some sense into the first half of the fifth century, the hope of finding any substantial remains of the Verulam which St. Germanus visited in 429 has remained no more than a hope. Not only so, but in all the areas excavated in the southern part of the town both the structural evidence and the coin-finds make it clear that urban life hereabouts had for all practical purposes ceased long before the days of St. Germanus : ' after the Constantian renaissance there is no evidence, throughout the eleven acres [excavated], of the building or re-building of a single wall ' (p. 29). Yet, as the excavation of the theatre and the adjacent temple abundantly showed, the central area of the city was still very much alive in a rather parasitic fashion in the later part of the fourth century and its inhabitants were treating both their public buildings and their money with that light-hearted abandon which seems to have prevailed everywhere in the last days of Roman Britain. Was this shrinkage gradual or sudden ? How much of the city shows this extended occupation ? Was there a hard and fast line between the deserted and inhabited areas or any attempt to improvise defences for the latter ? These are questions not only of local but of general historical importance, and Verulamium provides perhaps the best chance anywhere in Britain of illuminating the problems they imply. But Dr Wheeler has no answers to them in the present report, and we can only hope that he will soon find the opportunity to take up again this very important part of his unfinished task.

One further matter may be briefly mentioned. The necessity of forcing the account of this extensive campaign of excavation into the limits of a single manageable volume has compelled the authors to perform miracles of compression and selection in the display of their material. But our admiration for the judgment which they have shown in this most difficult of tasks can be pardonably blended with the regret that it was necessary at all. Take the pottery for example. The Belgic series from Wheathampstead and Prae Wood have been rightly illustrated in full and these, supplemented by the Colchester material which should shortly be published, will become the standard authority on Belgic ceramics in this country. But with the Roman pottery things are different. The Samian, of which quantities must have come from closely dated deposits, has not been published at all, and this is the more unfortunate in view of the doubts about the value sometimes accorded to Samian for dating purposes which have recently

been voiced by high authority in the *Journal of Roman Studies*.[5] The evidence of Verulam ought to be made available to throw what light it can on a controversy which is of fundamental importance in the development of scientific methods in Romano-British archaeology.

Then again Verulam might have been made the occasion for a thorough classification of Roman fashions in coarse pottery in southern Britain. A really comprehensive series of coarse pottery forms reliably dated on their own merits from a single south-midland site is one of the main desiderata of Romano-British archaeology and Verulam is in many ways the ideal site to provide it. The material must be available, but a one-volume report has obviously no room for such a series. It is indeed remarkable that drawings of as many as eighty-four Roman pots have somehow been squeezed in. They consist however almost entirely of groups from four or five sealed deposits which are of special importance for dating the defences and other excavated buildings, and no fewer than sixty-three of them belong to the second century. While we must be duly grateful for them, they are thus no adequate substitute for a really comprehensive series, for from the later periods, the third and fourth centuries, practically no pottery has yet been illustrated at all. What is clearly wanted is a companion volume to the present report and it should not only contain the Samian and coarse pottery, but also type series of the many varieties of small objects for whose proper classification the excavations must have provided much new evidence.

A point of minor detail may be mentioned in conclusion. Bede's words (*Hist. Eccles.* I, 7) suggesting continuity of Christian worship[6] through the early Saxon centuries on the site of St. Alban's martyrdom perhaps deserve a mention on p. 35, especially as they show that if Offa really had difficulty in locating the saint's tomb in the eighth century, the ' lapse in the Christian tradition at Verulamium ' can be closely dated between 731, when Bede's *History* was finished, and 793 when Offa's search took place ; a somewhat unexpected conclusion. The book on the whole is excellently printed but something has gone wrong with the date of discovery of the Colchester temples on p. 133, and with the reference to Bede on p. 33 n., where ' *Historia Ecclesiae* VII ' should be ' *Historia Ecclesiastica* I, 7 ', and it was a little disconcerting to the present reviewer to find his name spelt ' Myras ' on p. 115.

[5] 1935, XXV, 187 ff.

[6] In quo . . . loco usque ad hanc diem curatio infirmorum, et frequentium operatio virtutum celebrari non desinit.

The greater part of this review has been deliberately taken up not so much with the positive achievements of the authors' work at Verulamium as with what may be termed its negative results, the old questions which they have not answered, and the new problems which they have created but not solved. A two-fold justification may be pleaded for this somewhat ungracious procedure : first, that the positive achievements are so notable and their exposition so excellent that to concentrate on them would have turned this notice into a tedious procession of superlatives ; and secondly the very real danger that these negative results may be forgotten in the chorus of applause which the appearance of this report has naturally and rightly evoked.

And there is a final moral to be drawn. It will be apparent on a moment's reflection that these negative results could have been turned into positive achievements of even greater significance than those here recorded if rather more time had been allowed for the excavations, and rather more space for their publication. The plain man's quarrel with Dr Wheeler and the Society of Antiquaries is not with what they have done at St. Albans, for that could hardly be bettered—it is with their failure to do more. It must from the start have been obvious that Verulamium is far too big a site to yield all its secrets in five years, and that a single volume is far too small a space for the proper record even of five years' work. Yet there is no hint in this report of a recognition of these obvious facts, no discussion of prospects for the future. And it is even true to say that the casual reader of this beautiful and brilliant book might well draw from it the impression that it contains all that is worth knowing about the Belgic and the two Roman cities of Verulamium. This air of finality is both needless and misleading. If attention has here been concentrated on some of the secrets which the site still holds, it has been in the fervent hope that the very excellence of the work that has been done will not prevent the recognition of their persistence, and above all will not defer for long a fresh effort to bring them to the light.

Were the Giza Pyramids Painted?

by A. Lucas

SO far as is known to the writer, the only published studies of this subject are one by himself, made many years ago,[1] and a more recent one by Professor André Pochan,[2] though references to the appearance and colour of the stones are not uncommon. Thus both Jomard[3] (who climbed the pyramid) and Maspero[4] (who apparently did not climb the pyramid, but relied upon Jomard's description) both say that the portion of the casing of the pyramid of Chephren, still remaining in place at the apex, is coloured reddish in patches by lichen, the identification of this apparently having been made by the well-known botanist Delile, who accompanied Jomard on his climb up the pyramid.

Professor Pochan, who also climbed the pyramid of Chephren, and examined the stones at the apex, states that he saw lichen, but only on the north side, where the colour was blackish, and that the stones in general are of a reddish-brown colour. No proof that the black was indeed lichen is given, and the very dry situation would seem to make the presence of lichen improbable, unless it is growing on the patches of bird excrement that Jomard noticed, which, however, are not likely to be confined to the north side. An examination for lichen by a mycologist would seem to be desirable. Professor Pochan also examined a large number of broken fragments of casing stones found on the ground, from both the pyramid of Chephren and also from that of Cheops, and states that the colour of the face (which can be identified by the angle of slope) was generally reddish-brown, though in some instances, brownish-black.

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[1] A. Lucas, *The Blackened Rocks of the Nile Cataracts and of the Egyptian Deserts*, 1905.

[2] A. Pochan (Professeur de Sciences au Lycée français, Le Caire), 'Observations relatives au revêtement des deux grands pyramides de Giza', *Bulletin de l'Institut d'Egypte*, 1933–1934, XVI, 214–220.

[3] M. Jomard, 'Description générale, de Memphis et des pyramides', in *Description de l'Egypte, Antiquités*, 1818, II, 80, 82.

[4] G. Maspero, *Histoire ancienne de l'orient classique*, I, *Les origines*, p. 371.

The writer has seen the colour of the apex of the pyramid of Chephren only from the ground, from where it appears to be brown, but he has examined, at the foot of this pyramid, and also at the foot of the pyramid of Cheops, stones now lying on the ground that, from their sloping surface at one side, must originally have formed part of the casing of the respective pyramids. One visit to the pyramids was made by the writer in company with Professor Pochan, when a large number of specimens of stones, with one sloping coloured face, were taken for subsequent examination in the laboratory, so there cannot be any doubt that the specimens examined were similar to those described by Professor Pochan. The results of the examination will be given later.

Although Herodotus, Diodorus, Strabo and Pliny all describe the Giza pyramids, none of them makes any mention of the surface being painted.

Professor Pochan quotes Philon de Byzance, as cited by Letronne, for the statement that some of the stones of the pyramids have the transparency of glass, while others are greenish, light yellow, or red, as though they had been painted. None of the stones, however, is transparent, or like glass, and none that the writer has seen is greenish, or yellow. The red colour will be discussed later.

Several Arab writers allude to the pyramid of Mycerinus as being coloured or painted, but, as pointed out by Professor Pochan, this manifestly has reference to the red colour of the granite casing blocks.

Professor Pochan states that a chemical examination of the red coloration on the exposed parts of the casing stones from the pyramids of both Cheops and Chephren proved it to consist of oxide of iron, and that, for a depth of about half a millimetre from the surface, there is a layer harder than the rest of the stone, and of a different nature, containing calcium sulphate (gypsum), silica and probably organic matter. From this he deduces that the outsides of the two pyramids were originally coated with a thin layer of siliceous gypsum plaster, probably containing organic matter, which was painted with a pigment of red ochre (oxide of iron).

The writer is in entire agreement with the results of Professor Pochan's analyses, namely, that the red colour is oxide of iron, that the coloured surface is harder than the rest of the stone and that calcium sulphate (gypsum), silica and organic matter are all present, but he cannot agree that the two pyramids in question were originally coated with a siliceous-gypsum plaster painted red, the colour, as well as the

calcium sulphate and the hardness, being merely the result of the ordinary desert patination.

In the writer's article on the desert coloration of rocks he stated that ' the step pyramid at Saqqara, the three large and various small pyramids of Giza all show a well-defined browning of the outer surface ', and ' although the browning is more pronounced on the outside, it is present also on the less exposed surfaces, as in the cracks and crevices between the stones, and, even several metres deep down the open passages, such as that in the third pyramid[5] at Giza '. ' The brown coloration of the surface of the pyramids at Saqqara and Giza . . . is largely a desert coloration, the colour being in great part cemented fast to the stones ; in some cases, however, the colour is intensified by the presence of dust or other loosely adherent material '.

At that time the writer had not made a special study of the coloration of the original casing stones of the pyramids, though he noticed that ' that part of the casing of the second pyramid,[6] which still remains, is usually browner than the rest of the pyramid, from which the coating has been removed '.

The ordinary desert film has been described by many students[7] and it is generally agreed that the red coloration is due to oxide of iron, the black to oxide of iron, or oxide of manganese, or both, and the intermediate shades to mixed oxides of iron and manganese. A difference of opinion, however, exists whether the constituents of the film are derived from the stone itself (all the ingredients occurring in the stone), or from deposited dust, though the greater number of investigators (including the writer) believe that they originate from within the stone.

In addition to oxides of iron and manganese, the writer found that the desert film also contains alkalies, alumina, calcium compounds

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[5] That of Mycerinus. [6] That of Chephren.

[7] W. P. Blake, *Trans. American Inst. of Mining Engineers*, Sept. 1904. Von G. C. Du Bois, in *Tschermak's Min. u. Pet. Mittel*, XXII, section 1, Vienna, 1903. Fraas, *Aus dem Orient*, Stuttgart, 1867, p. 477. G. Linck, *Jenaische Zeitschr. f. Naturwissensch*, 1900. A. Lucas, *op. cit.* J. P. Merril, *Rocks, Rock-Weathering and Soils*, p. 256 ; *Bull.* 150, *U.S. Geological Survey*, 1898, p. 389. J. C. Moulden, *Trans. American Inst. of Mining Engineers*, Feb. 1903. Obrutschew, *Verh. russ. Min.-Ges*, St. Petersburg, 1895, p. 229 ; *N. Jahrb. f. Min. Geol. u. Pal.*, 1897, II, p. 469. Overweg, *Zeitschr. der Deutschen. Geol. Ges.* 1851, p. 100. G. Schweinfurth, *Zeitschr. f. Ethnologie*, 1903, 5, pp. 798–822. C. G. Seligman, *The Older Paleolithic Age in Egypt*, pp. 138–141. J. Walther, *Die Denudation in der Wüste*, 1891. Wheeler, *Peterm. Mitt.* XXII, p. 337. K. A. Zittel, *Palaeontographica*, 1883, XXX, 58–59.

(including the sulphate-gypsum), magnesium compounds, phosphate and silica, all of which he believes originate from within the stone, in which they all occur. The writer's conclusions as to the method of formation of the patina, given in the article referred to, are as follows :—

(1) All rocks are more or less permeable to water.

(2) Most rocks contain traces of alkalies, alumina, calcium, iron, magnesium and manganese compounds and silica.

(3) These compounds are all soluble, to at least some slight extent, in pure water, this solvent action being much increased by the presence of certain other substances, such as carbon dioxide and phosphoric acid and by a relatively high temperature.

(4) Water in the form of occasional rain, or of frequent and heavy dew, or morning mist, gains access to the rocks, even in desert regions, and dissolves the various soluble constituents.

(5) The solution thus formed is brought to the surface by capillary attraction, and the water is there evaporated, leaving the solid matter.

(6) Some of the solid matter, such as the compounds of iron and manganese, is subject to further alteration at the surface of the rocks, whereby insoluble oxides are formed.

(7) A hot climate and small rainfall are necessary for the formation and preservation of the patina.

As a result of his recent examination of the specimens from the casing stones of the pyramids of Cheops and Chephren respectively, which are about 4800 years old, the writer found that the patina, although more coloured (redder or blacker as the case may be) than that of the stones of the present surface, from which the casing was stripped not more than about 1200 years ago, contains the same ingredients, namely, oxide of iron (red), oxide of manganese (black), calcium sulphate, silica and various other ingredients. The stone below the patina-covered surface also contains the same ingredients in small proportion. In the course of the work it was noticed that practically white, or only very slightly yellowish, quartz pebbles became covered with veins, streaks and patches of red oxide of iron when repeatedly strongly heated in an electric muffle furnace, hence heat alone can form a red patina on the surface of a stone containing iron compounds. No evidence of lichen could be found on any of the coloured patina examined. The presence of oxide of manganese is not mentioned by Professor Pochan, and the organic matter found by him is only that naturally present on any surface exposed to the atmosphere and not an organic material used as an adhesive with paint.

In this connexion it may be mentioned that the quotation from Reisner made by Professor Pochan relative to the use of an adhesive for cementing together the finely powdered quartz that constitutes the body material of faience, is quite irrelevant and appears to have been misunderstood, owing probably to Professor Pochan's imperfect acquaintance with English.

Hudd[8] gives the following analyses of the patina on the pyramids of Cheops and Chephren respectively :—

Oxide of Iron	Pyramid of Cheops	Pyramid of Chephren
	%	%
In surface patina	0·20	0·45
In layer under patina	0·15	0·10
In interior of stone	—	0·05

The hardened surface of the patina-bearing stone is explained by Ball[9] as follows :—

> ' The result of dew and light rains falling in the night is that a film of water remains on the exposed rock surfaces for several hours, during which time it dissolves small amounts of carbonates and silicates in the rocks, only to deposit its solid contents again on evaporation in the morning ; and the deposited matter, being in a molecular condition, is left in the minutest pores of the rock, converting, for instance, the superficial layer of a soft sandstone into a hard skin more resembling quartzite ' and ' . . . the top of Gebel el Tih is covered with limestone blocks having a hard brown skin formed in this way '.

Linck[10] explains the indurated surface of rocks in the same manner and the writer has independently come to the same conclusion, namely that the hardened surface is merely one of the results accompanying the formation of patina.

[8] A. E. Hudd, ' The Great Pyramids of Gizeh ', *Proc. Clifton Antiq. Club*, VI, p. 22.
[9] J. Ball, *The Geog. and Geol. of West-Central Sinai*, pp. 176–180.
[10] G. Linck, *op. cit.*, p. 8.

A 6th century German Settlement of *foederati*

Golemanovo Kale, near Sadowetz, Bulgaria*

by Gerhard Bersu[1]

In the fertile region between the Danube and the Balkans occur numerous Byzantine fortified posts, which are shown by occasional finds of coins to date mostly from the sixth century. All have a common form in that skilful use has been made of natural features of terrain, such as isolated mountain-tops or practically isolated spurs, so that with a minimum of artificial strengthening they have considerable defensive power. A favourite situation for them is at points where narrow canyon-like valleys of the streams that flow into the Danube have afforded good natural advantages.

From the military standpoint these sites can easily be divided into two groups, A and B, according to their topographical situation. To the first belong those which occur on the great natural trade-routes, and, like a modern *Sperrfort*, rake the roads with a commanding view over the surrounding district. The second and much more numerous group consists of posts situated off the trade-routes, often so much concealed by the lie of the land as to be invisible from the great roads.

Owing to the lack of accurately based topographical knowledge, and since no organized archaeological service exists in Bulgaria, we are at present without any map of these sites, or any useful detailed survey of the ruins in their present condition ; and it is exceedingly probable that only a small fraction of the available material is known. Frequent finds of Byzantine gold coins have been made in the sites, and they have become the happy hunting-ground of the treasure-seeker. Most of the numerous gold coins on sale in shops may have come from them.

Until recently none of the posts had been excavated, either in the region under consideration or in Bulgaria generally. In 1934 Iwan Welkow made the first extensive excavations, near the village of Sadowetz in the Vit valley, on the site of the fort Sadowsko Kale.[2]

* Sadowetz lies 40 km. south of the Danube, 50 km. north of the Balkans. On the map it may easily be found by drawing a line from Sofia northeast to Plevna. Then it will be seen 105 km. north of Sofia, 25 km. southwest of Plevna, practically on the connecting line at its point of intersection with the Vit.

[1] Translated by Professor R. G. Austin.

[2] See *Germania*, 1935, XIX, pp. 149 ff. for an account, with many illustrations.

This work, which is not yet complete, produced valuable and beautiful finds ; and it led to the investigation of the fort Golemanovo Kale[3] on

FIG. 1. PLAN OF GOLEMANOVO KALE (2ND PERIOD), 1:1000. Interval between contours, 1 metre

the opposite bank of the river, which was begun in 1936 as a joint

[3] The name is modern. Kale=castle; Golemanovo comes from the name of the former landowner, Golemanov.

FIG. 2. PLAN OF NORTH BANK OF THE VIT VALLEY, 1·5000
Distance between contours, 2 metres

facing p. 32

undertaking of the Bulgarian and German Archaeological Institutes, under my direction, and completed in December 1937.

Golemanovo Kale shares common topographical features with Sadowsko Kale in the Vit valley, Nakuhovo Kale near Bežanovo, 6 km. to the south, and Gradište near Dragana, a similar distance still further south (both these latter are in the Kamenitza valley[4]). A broad meadow below the sites provides fine pasture-land, while the fertile soil of the undulating table-lands around is excellent for ploughing ; on several sides a natural defence is formed by sheer precipices, 30–50m. deep. Only a portion of the circuit needs to be fortified by walls, but at the weakest points there were often several, one behind the other. The gates always lie at the ends of these walls. From the table-lands, which are deeply cleft by the river, the sites are only visible at very close quarters. Since the rivers follow a very winding course, these forts cannot be taken as barriers on a road running along the valley ; on the contrary, the old trade-routes to the Balkans and to the passes towards Thrace run at some distance away, on the table-lands. Golemanovo Kale is one of the larger sites of group B, while Sadowsko Kale is one of the smaller ones. But there is no great difference in size between any of them, and Golemanovo Kale may be taken as typical of this group (B) of Byzantine fortified posts.

The sort of terrain aimed at may clearly be seen[5] from the contour-plan (FIG. 2) and FIGS. 8–12. The table-land to the north falls away in a steep wall of rock towards the plain of the Vit valley, and a gap in this wall is formed by a valley running southward from the table-land with similar steep slopes. Close in front of the entrance to this little valley a spur rises roughly parallel to the precipice where it falls away towards the river : so that a practically square space results, some 100 m. each way, jutting out slightly towards the Vit valley, connected with the table-land only at its southwest corner, and easily accessible from there. The west side of this square is almost completely fortified by the natural precipice (FIG. 10), while to the south only two narrow, steep slopes between the three brows of cliff afford a means of access, and a difficult one at that (FIG. 8). The southern portion of the east side is likewise protected by precipices (FIG. 11), and only the north side needed a stronger defence (FIG. 9).

[4] The remaining fortifications shown by Welkow (*Germania*, l.c., fig. 1) belong to periods other than the 6th century.

[5] For this remarkable new topographical map of the surroundings, as well as the contoured plan of the site itself, I have to thank the Bulgarian Geographical Institute, Sofia.

This is not the first settlement of which traces remain, as may be expected in a fertile region that invites settlers. In late neolithic times the peoples of the Gumelnitza culture[6] were numerous in the whole area bounded by the later walls, as well as in the upper part of the little valley and apparently also on the table-land. This settlement met its end by fire. The district was next occupied sporadically in the period immediately preceding the Scythian invasions, and together with a little Celtic pottery there were also found fragments of some of the blue glass rings so characteristic of the latest Celtic period. From the end of the third to the end of the fourth century A.D. an open settlement occupied the northern slope and the area immediately adjacent to the innermost wall on the north, as well as the whole of the little valley. This was an industrial settlement, as is shown by the abundant iron slag and ovens. The pottery is throughout of the usual Roman provincial type. Like its neolithic predecessor, this settlement too was burnt ; its disappearance may probably be connected with the events leading up to the battle of Adrianople, or with the invasions of the Huns. In the fifth century and at the beginning of the sixth there was no further occupation. In Justinian's time, the fortification with which I am here dealing was constructed ; this, after a fire (period I) was immediately rebuilt (period II), burnt again about A.D. 600, and afterwards abandoned.

It was not until the twelfth century that the ruins of the site were again occupied, probably in connexion with the building of the monastery on the bank of the Vit (FIGS. 2 and 8). The tradition of the church in the settlement was continued, the dead were buried there, and probably also a small chapel was erected, of which a few traces have been found high above the débris of the Byzantine church. In the sixth century a settlement had been made on the ridges and the table-land to the west of the site, to which a church also belongs (PLAN, FIG. 2 ; these remains are not discussed in this paper). This open settlement, which had clearly used the protection of the fortified post, and which was inhabited by people for whom there was no more room within the walls, was destroyed, together with the fortification, about A.D. 600.

It can be seen (PLAN, FIG. 1) with what remarkable skill the position was strengthened in the sixth century by defence works. The kernel of the defence is the imposing Great Tower, occupying the most

[6] Ion Nestor, *Der Stand der Vorgeschichtsforschung in Rumänien* (22 Bericht der Römisch-Germanischen Kommission 1932), Frankfurt (Main) 1933, 57. A detailed description of this culture is given there ; its remains occur also in other ancient fortifications near the Vit.

exposed position, measuring some 11 m. square. Its inner chamber is bisected by a wall, and has an entrance on the south side (B 5). Two to three metres of its original height are still *in situ*. If it was originally ten metres high, it would have afforded a wide view from its platform, without anything being visible of the rest of the fortified position lying beyond. In the second period of the settlement a bastion (of which remains still exist, A B 5) was added to the tower on the western side ; this was the only important change made as compared with the first period.

From the Great Tower and its connected bastion three walls were built, each high above the other, to fortify the northern part of the site which was not protected naturally. They were carried square across the northern slope as far as the steep cliff on the east, and there joined a wall running north and south. They have no ditch in front of them. Against the lower wall, besides two ramps (B 6, D 6) which made ascent possible to the ramparts, three chambers were built, intended as a permanent shelter for the guard. One of them, at the bend of the wall, was built up in the form of a tower (C 6–7). The middle north wall has no adjacent buildings, so that between it and the third or inmost wall there is an open corridor (FIG. 3). To the defences of the third wall a tower (D 5) was added in the centre in the second period, and a ramp constructed to the west of it. At the eastern and western ends of these three walls there are narrow openings, only 1.70 m. wide, giving access to the inner quarter. Their narrowness, and the steps leading to them, show that they were intended only for men on foot and for cattle, not for wheeled traffic. The western gates were guarded by the Great Tower and the bastion. The lower eastern gate had a tower-shaped superstructure (E 7). This gateway led behind the east wall to the upper eastern gate (E 5–6). Between these gates are four hooked fragments of wall (E 6), with a wooden upper portion, below which ran the eastern entrance-way, at first sunken. This upper gate was likewise fortified by two towers, at the east end of the corridor and of the tower-shaped superstructure of the gate-chamber built on to the third north wall (E 5). In the east wall there was a slype gate, later blocked up (F 6). Following the lie of the land, and therefore presently making a sharp bend southwards, this wall then closed the inner quarter on the east as far as the precipice (G 3). At the bend there was another tower (G 5). This part of the wall, built on the narrow ledge of the cliff (FIG. 9) is now only in a fragmentary state. The western wall is in a similar condition ; it begins at the southwest corner

of the Great Tower, runs along the outermost edge of the precipice, and stretches southwards until the sheer line of cliff, 30 m. high and partly overhanging (FIG. 10) made any further artificial protection of the inner quarter superfluous (B 3). Probably the first building next to the Great Tower was also tower-shaped (B 4).

On the south only the foundations of the defence-works have been preserved. Since the ground falls away southward to the river (FIG. 8) in three projecting spurs (D 1, F 2, G 2), with insurmountable precipices, all that was needed here was to block the two deep narrow gullies between the cliffs with a wall (E 2, F 2). These two walls are built on the sloping ledge of the cliff, and the difficulties presented by the terrain can be realized by the extraordinary breadth of the foundations of the wall which bars the western gully (E 2). Very probably there was a slype-gate, leading down to the river, in the eastern wall.

There was no special preparation of the subsoil beneath any of these defence-walls ; they are partly built on the rock, partly on clay, and nowhere have they any extra base to their foundations. Normally they are preserved in the surrounding débris to a height of 3 m., as compared with the old ground-level (FIG. 3). Their thickness varies between 2 and 1.5 m. Their construction shows the ordinary building-technique of Byzantine walls : layers of pieces of limestone alternate with a generous spreading of white mortar between two outer layers of small rough-hewn limestone blocks. The inequalities of the outer surface have been partly covered with a thick coating of the same white mortar, so as to present a smooth appearance. The method used betrays haste, and although the whole is well planned, from a technical point of view the details are unsound. As a result of inadequate foundations, large stretches of the walls have collapsed or been completely levelled. To judge from one block of the wall which has fallen in this way, the height of the first northern wall may be put at a minimum of 6 m. There were no lacing-courses of bricks or any bricks employed.

The space bounded by the first and second north walls (B–E 6), and the east wall, is free from inner buildings. It must have served to shelter cattle or the inhabitants of the open settlements when danger threatened. But the area to the south of the third north wall is all the more closely built up. Here the most noticeable thing is the outline of the church (DE 5 ; FIGS. 3–6 and 13, 14), backed as it is in such a curious way against the inner wall of fortification. The choice of this unusual position, which had many disadvantages, cannot be explained as due to the configuration of the land, nor has investigation of the

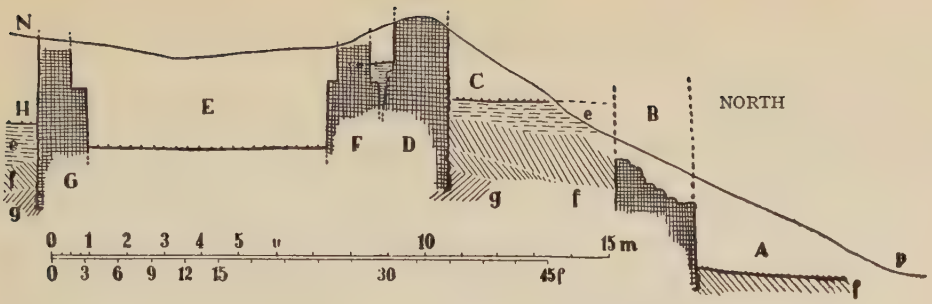

FIG. 3. CROSS-SECTION NORTH BY SOUTH, THROUGH CHURCH AND TWO INNER NORTH WALLS OF FORTIFICATION (A-B = FIG. 6) 1 : 200

A, ground-level of space between outer and middle north wall; B, second north wall; C, ground-level of corridor (2nd period); D, inmost north wall; F, north wall of church; E, ground-level of nave; G, south wall of church; H, ground-level of passage behind church; N–P, modern ground-level, below, white débris after destruction in 6th century; e, débris and ash from period I; f, débris of 4th century settlement; g, neolithic culture-level.

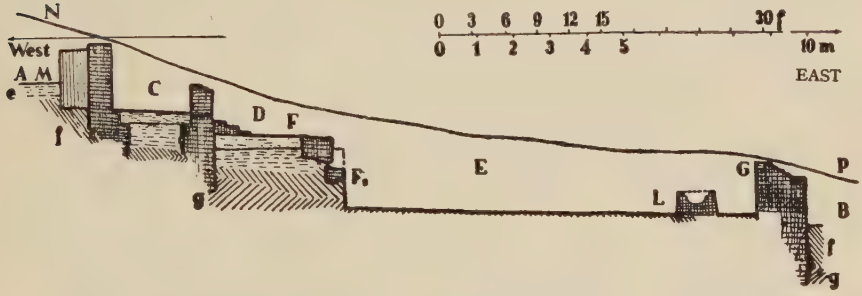

FIG. 4. CROSS-SECTION THROUGH CHURCH, EAST BY WEST (C–D = FIG. 6), 1 : 200

A, level of tower; B, level of terrace east of apse; C, level of entrance-hall; D, level of gallery; E, level of nave; F, wall of gallery (F I, period I); G, window; L, altar; M, east wall of tower; N–P modern ground-level, below, white débris after destruction in 6th century; e, débris and ash from period I; f, débris of 4th century settlement; g, neolithic culture-level.

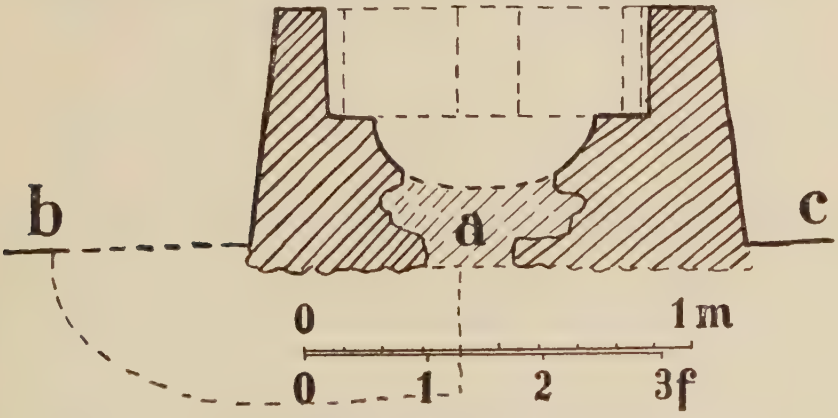

FIG. 5. VERTICAL SECTION THROUGH ALTAR, 1 : 20

a, break in wall (? position of reliquary); b–c, ground-level of nave

subsoil thrown any light on it. There would have been many possible ways of giving the church a much more imposing position. There is not even any question of the continuance of an earlier tradition, for below the church and in its neighbourhood were found the buildings and hearths of the fourth-century industrial settlement. It seems therefore part of a deliberate plan that the church was sunk into the ground as it were like an ancient Mithraeum (see FIG. 3), with the resulting disadvantage that it was only accessible from one side, from a narrow street, and that the wall of the fortification took the light from the inner chamber. The church (FIG. 6) consists of a nave (E), gallery (D), and an outer hall (C) which provides a way up to the gallery (H), while the nave had an entrance on the south (K). The existence of a gallery, as well as the peculiar shape of the altar (L) in the nave, which is in a good state of preservation, is so far unparalleled in sixth-century Byzantine architecture in Bulgaria. The appearance of this altar may be seen from the illustrations (FIGS. 5, 15). It is built of masonry and coated with stucco. Apparently there was a reliquary at the point marked *a*, which was broken away when the church was destroyed. The floor was of clay, perhaps partly with a layer of wood. The apse had a dome constructed of great flat bricks of unbaked clay ; the nave had a wooden barrelled-vault, and the roof was of straw or shingle. The walls must also have had a lining of wood, for they now show only a rough dressing, and there are no traces of stucco.

The walls of the church were built with a much better technique than that shown in the circumvallation. They date from the first period, while in the second the gallery was raised and a stairway built in the outer hall leading to the tower or to the ramparts.

On the other hand, the greater part of the buildings in the inner quarter were renewed after the fire which ended the first period of settlement. As far as can be ascertained, no fundamental difference of plan resulted. The lay-out of the streets was practically the same as in the second period. The chambers built on to the walls (*e.g.* C 5, F 5, etc.) suggest the casemates usual in Byzantine fortifications, but the construction of the inner quarter differs basically from that of purely military posts. Narrow, alley-like streets, which naturally did not need to be wider than the gateways in the walls, separated the inner quarter into blocks of buildings containing one or more rooms. These open lengthwise on to the streets, and sometimes make formal *insulae* (C D 3), in which narrow intermediate spaces, acting as gutters, separate the individual houses. To make the most of the available space, the buildings are

pushed right up against the outermost edge of the precipice (A, FIG. 10), and certainly wooden railings were needed to prevent men and cattle from falling over. The uneven nature of the ground, and the considerable differences in height both within the settlement as a whole and within single blocks, are shown by the contours of the plan. These variations were so considerable that many of the buildings (*e.g.* D 2) were certainly two-storeyed, and steps were found cut in the streets (E 3). The streets are not paved, and their subsoil is

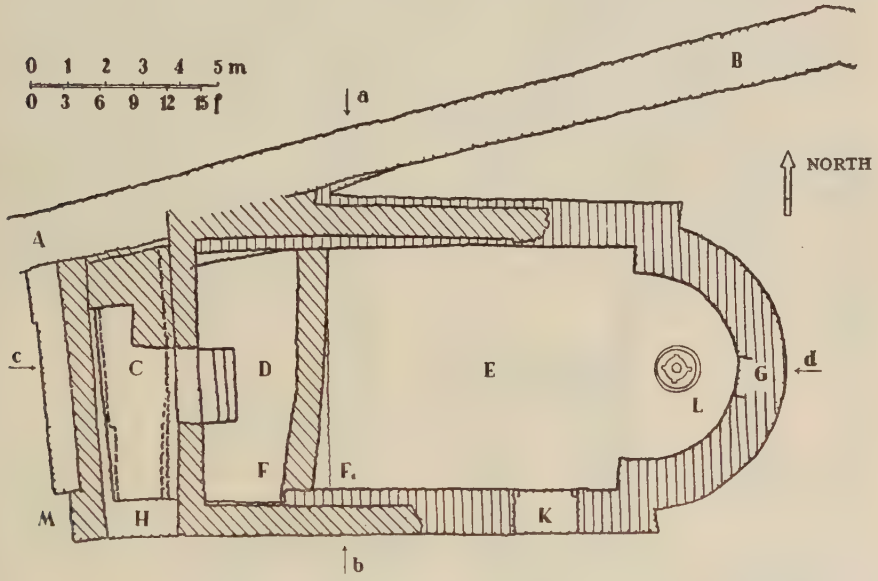

FIG. 6. GROUND-PLAN OF CHURCH, 1:200

A–B, inmost north wall of fortifications; C, outer-hall; D, gallery; E, nave; F, wall of gallery (F 1, first period); G, window; H, entrance to entrance-hall; K, entrance to nave; L, altar; M, east wall of tower (a–b=fig. 3; c–d=fig. 4)

either hard, weatherbeaten clay (the older cultural strata), or rock. If the space was too narrow for a street, they did their best by rounding off the corners that stood in the way (D 4, FIG. 7). Nothing was left standing of the upper parts of the buildings. This was due first of all to the fact that no mortar was used to cement the walls of the houses; instead they were constructed of pieces of limestone, easily liable to crumble, with earth as a binding material, so that they were predisposed to collapse. Secondly these walls were not originally very high, for they were only

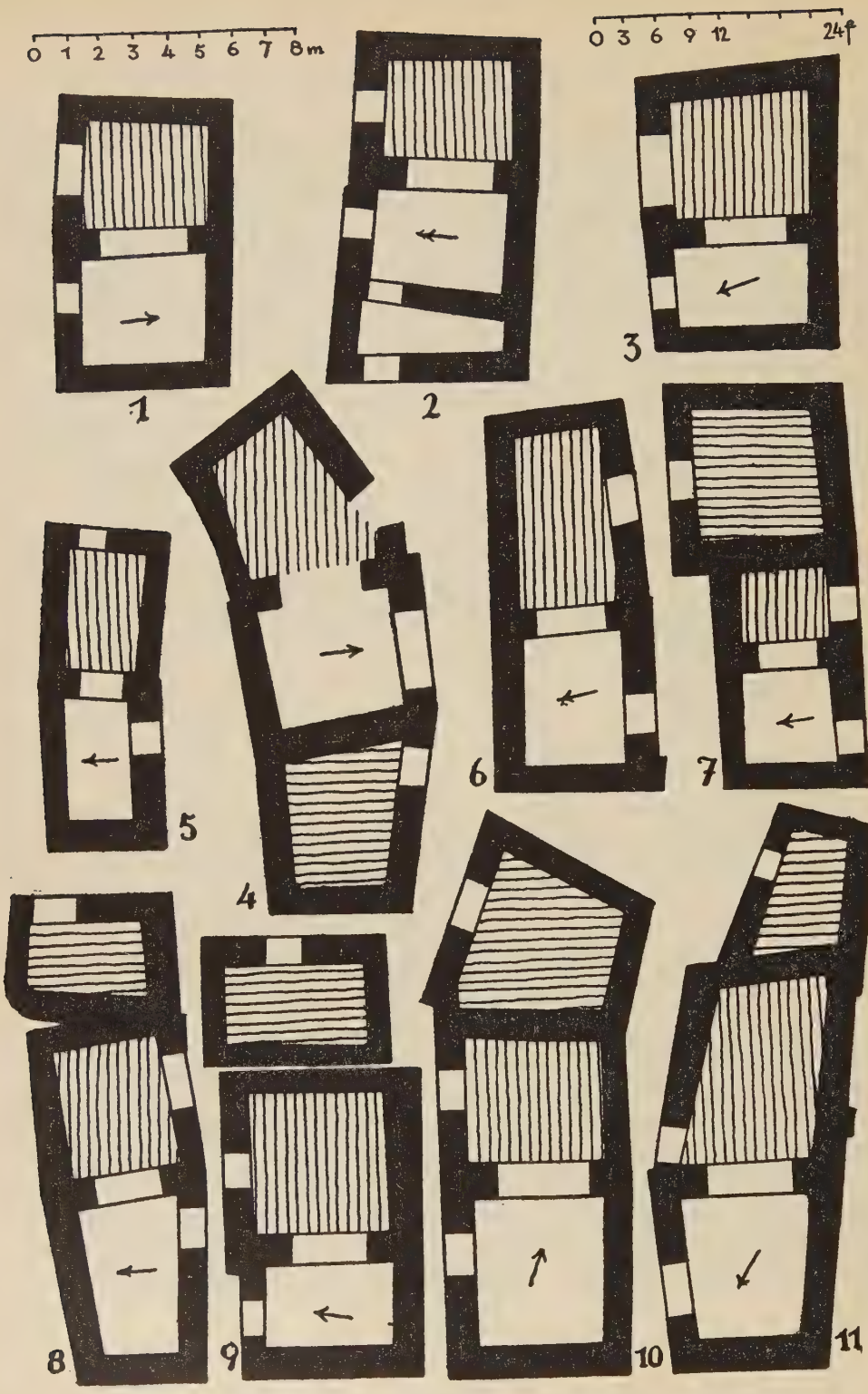

FIG. 7. GROUND-PLAN OF STONE SOCLE OF DWELLING-HOUSES, 1:200
White, living-room with upper structure of wood and clay; perpendicular lines, stable (?); horizontal lines, store-room. The arrow marks North.

FIG. 8. VIEW OF GOLEMANOVO KALE LOOKING NORTH FROM VIT VALLEY
A, end of west wall. B, end of east wall. C, ruins of 14th cent. monastery. D, E, south wall

FIG. 9. VIEW OF GOLEMANOVO KALE FROM THE PLATEAU, LOOKING WEST
A, great tower. B, upper east gate. C, lower east gate. D, end of east wall. E, south wall (eastern portion)

facing p. 40

FIG. 10. PRECIPICE ON WEST SIDE WITH REMAINS OF FORTRESS-WALL (ARROWS) ON ITS EDGE
A, last house on edge of cliff

FIG. 11. FOUNDATIONS OF WESTERN PORTION OF EAST WALL
B. Sadowsko Kale on the south bank of the river Vit

FIG. 12. GOLEMANOVO KALE FROM THE SOUTHEAST, FROM THE VIT VALLEY
A, great tower. B, end of the west wall. C, end of the east wall

FIG. 13. VIEW OF WEST PART OF CHURCH
C, entrance hall. D, gallery of nave. E, surface of the nave. F, gallery-wall. F1 = period 1

FIG. 14. EAST END OF THE CHURCH SEEN FROM TOWER

C, entrance hall. D, gallery of nave. E, nave. F, wall of upper part of nave. G, window. K, door in nave. L, altar. a, b, recesses for wooden arch

FIG. 15. ALTAR OF CHURCH (cf. FIG. 5)

socles for an upper portion of organic material, which produced that thick upper layer of ash or burned clay which was met with everywhere in the inner quarter. On an average the thickness of the socle is 60–70 cm., and the height varied from 0.5 to 2 metres, according to the ground. The composition of this upper part was various. In one part of the buildings it consisted of a mixture of chaff and clay, and wood in the form of beams together with a wattle of thin lathes. The rooms thus walled always yielded many finds, especially pottery and domestic utensils, so that they were clearly recognizable as living-rooms. It was not possible to ascertain the position of the hearths. The living-rooms must have originally been floored with wood. The inner quarter nowhere had any special paving ; the subsoil was of clay from the culture-strata, or of rock. From the character of the utensils it is incontestable that a peasant people dwelt there. These rooms have a wide aperture leading longitudinally to a second chamber, where no finds were made. Both are accessible from the street by more or less broad doorways cut out of the socle. The second room had an upper portion entirely of wood, no clay being used. The wide opening in the party-wall proves communication between the two chambers, which in my view were a living-room and a stable for cattle respectively, forming together a single house-unit. Such units are so frequent that they may be regarded as characteristic of this settlement (FIG. 7, 1–3, 4). In some instances the living-room is subdivided by a further party-wall (FIG. 7, 12). These houses are built either separately (E 4), or in longitudinal rows with the narrow sides adjoining (B C 4). Besides these two-roomed houses there are single-roomed dwellings with an upper portion of wood and clay. Possibly these were inhabited by the artisans attached to every settlement, for, as the discovery of a casting-mould shows, metal-workers were there. But there were also many one-roomed buildings constructed in the upper part entirely of wood ; these yielded no finds, and their entrances were often so high that they can only have been accessible from the street by means of steps or ladders. These buildings, in my opinion, were store-houses for corn, etc., such as must certainly be presupposed as an important part of a fortified peasant-settlement. Sometimes such a store-room is added longitudinally to one of the two-roomed house-units previously mentioned (FIG. 7, 4, 7–11) : in this case there is no direct entry in the lower storey from the stable to the store-room. It is generally accessible only from the street. But usually the store-rooms stand by themselves, sometimes in rows beside one another, separated by narrow lanes

(D 2–3). We can assume 35–40 dwelling-houses and 40–50 store-rooms in the inner quarter. The roofs of the inner buildings, and of the towers also, were of wood, shingle, rushes, or straw. There were nowhere any finds of fallen tiles in the untouched layer of ash. The presence of supporting central struts suggests that a crested roof ran longitudinally along the buildings.

Since the double house-and-stable unit occurs also along the defence-wall (G 3–4), to which probably store-rooms were also added, the number of houses which could have served as a protection for a possible military garrison is still further lessened. Together with the purely unmilitary lay-out of the settlement, as above described, this points to the conclusion that we have here a fortified village inhabited by peasants. Among the dwelling-houses there is none which by reason of unusual size or by the wealth of finds in it or by its special position is marked out as that of the head of this peasant community.

The finds of coins show definitely that the inner buildings and the defence-works were constructed in the time of Justinian, and were destroyed about 600[7]. It is out of the question that fortified settlements of this type should have come into being in such numbers, under the firmly-established empire of Justinian, simply on the initiative of the local population ; especially if we remember also that they lie in a region close behind the important Danube frontier, guarded as it was by great new military works, and also away from the great roads protected by the purely military posts of group A. In the vicinity of Sadowetz alone there are four such settlements. We may infer therefore that it was by the deliberate policy of the government that fortified villages were planted—most of them apparently on new sites—in this fertile region ; their inhabitants were intended to provide for the agricultural needs of the army and of the government.[8]

The region was always exposed to the attacks of the tribes living beyond the Danube; and so, through the skill of the Byzantine engineers, whose experienced work is plainly to be recognized in the clever lay-out of the defence-works, the inhabitants of these settlements were enabled to defend themselves and their property as far as possible without military help.

[7] More accurate dates can only be obtained from examination of the very rich finds of coins, which has not yet been possible.

[8] Mr A. H. M. Jones refers to these and similar circumstances prevailing in Thrace in his fine book *The Cities of the Eastern Roman Provinces*, Oxford, 1937. [A review will be published shortly.—EDITOR].

These settlers were very well off. To begin with, there is the remarkable fact that their living-rooms had glazed windows ; and their wealth may also be inferred from the abundance of silver ornaments and, in particular, from the number of gold coins found in the excavations both at Golemanovo Kale and at Sadowsko Kale. So they were well paid for their supplies, and were therefore to a certain extent independent of the government. This is the only conclusion that can be drawn from the finds ; and if we fit it into the picture suggested by historical tradition, we must infer that the inhabitants of this and of the other fortified village settlements held the social status of *foederati*.

It is only possible to give a general answer to the question of the racial affinities of these peoples. After the departure in the fifth century of the Eastern and Western Goths who had settled in these parts the Goti minores remained behind, and mingled with new German immigrants from the other side of the Danube frontier. It is impossible to know how far the native elements still maintained themselves here in the troubled times between the third and fifth centuries, or the extent to which the non-German element had joined them from the East beyond the Danube. The German element is in any case markedly reflected in the finds of purely German manufacture (alongside of the predominating Byzantine ware).

More than 60 of the triangular arrow-heads[9] characteristic of the Avars were found, mostly along the line of the fortifications ; this fact, together with the abandonment of the settlement (which from the cessation of the series of coins can be dated to round about 600), helps to establish the circumstances under which the entire site met its end in a fire and was never rebuilt. It was the invasions of the Avars, historically well attested, that after the fall of Belgrade (Singidunum) brought to an end in this spot the last great effort of the old Byzantine empire, by destroying this carefully-planned system of settlements. This is shown also by traces of burning in the other fortified sites. So came the end of ancient history for the region between the Danube and the Balkans.

[9] See also Welkow, l.c., and plate 19, 1 ; 1–2, 6–7.

Nennius and the Twenty-Eight Cities of Britain

by Kenneth Jackson

In a recent article in the *English Historical Review* (vol. lii, pp. 193 ff.) Mr C. E. Stevens has examined the question of the 'Twenty-Eight Cities of Britain' which are spoken of by Gildas ('De Excidio', chap. iii); and, on the basis that Gildas knew of some Romano-British *Notitia Britanniarum*, has attempted with considerable success to discover what cities these must have been. Bede (*Hist. Eccl.* i, 1) and Nennius (*Hist. Britt.*, ed. Mommsen, pp. 147 ff.) both repeat Gildas' remark in much the same words; and in Section vi of the *Historia Brittonum* their names are given, with the heading *Haec sunt nomina omnium civitatum quae sunt in tota Brittania, quarum numerus est xxviii.* They are in Old Welsh of about the eighth or ninth centuries, and can therefore be contemporary with the compilation of the *Historia Brittonum*. Each is described as *Cair*, the Welsh equivalent of *civitas* in the late Latin sense. Another version of the *Historia Brittonum* has made the number into thirty-three, no doubt by misreading xxviii as xxxiii; the deficiency is filled up with five extra names also in Old Welsh. Some of the forms are however rather younger than in the first version (*e.g.* Cair Lion for Cair Legion), and the Expanded List may be a century or so later than the original.

Haverfield showed in the Appendix to his *Roman Occupation of Britain* (ed. of 1924, pp. 289 ff.) how the List was used by Henry of Huntingdon, who gave identifications of the cities, some correct but others obviously fanciful. His contemporary Geoffrey of Monmouth likewise knew the Nennian List; and corrupting them in his usual manner he gave his own equivalents for some of them, as fanciful as Henry's. English and Welsh antiquaries handed on for centuries versions of this list corrupted in various ways; those that give identifications are based on the worthless authority of Henry and Geoffrey. The Welsh version appears in many medieval Welsh manuscripts, generally in an antiquarian article entitled *Enweu Ynys*

Prydein, ' The Names of the Island of Britain ' ; that in the Red Book of Hergest (early 15th century) was edited by Professor Williams in the *Bulletin of the Board of Celtic Studies*, vol. v, pp. 19 ff. Some of the imaginary equivalents have found their way permanently into pseudo-learned Welsh nomenclature. An example is the modern dictionary rendering of Caer Lwytgoed as Lincoln ; see also Cair Grauth below. In fact none of them from Henry and Geoffrey down have any independent value, and in trying to settle what cities Nennius had in mind we can rely only on the internal evidence of his own list. Since it is possible to add a certain amount to what Haverfield had to say on the matter, it is worth while reopening the question of what the original Nennian twenty-eight cities really were. In the following pages one or two points are to be noted :—

1. The native language of Roman Britain was the branch of Celtic called British (abbreviated *Br.*).
2. Welsh is the direct descendant of British, which in the centuries preceding and following the withdrawal of Roman rule was evolving towards Welsh, just as on the continent Latin was becoming broken down and evolved into the Romance languages some time later.
3. The earliest form of Welsh, called Old Welsh (abbr. *O.W.*) is dated from the time of this break-up down to the 11th century. Medieval Welsh (abbr. *M.W.*) from the 11th to the 14th centuries, and Modern Welsh (abbr. *Mod. W.*) from the 15th century on.
4. The spelling of O.W. was more archaic than the pronunciation, so that for example
5. though the initial consonants of the town names in the list were already mutated in speech following the feminine noun *Cair* (M. and Mod. W. *Caer*), the mutation was not shown in the spelling. Thus O.W. Cair Caratauc, M.W. Caer Garadawc. These mutations, which affected all mutable consonants after a feminine noun, will be found to occur in the List as follows :—

c-,	still spelt *c-*			in O.W.,	becomes *g-*	in M.W.				
g-	,,	,,	*g-*	,,	,,	is lost		,,	,,	
p-,	,,	,,	*p-*	,,	,,	becomes *b-*		,,	,,	
b-, *m-*	,,	,,	*b-*, *m-*	,,	,,	,,	*f-* (i.e. *v-*)	in M.W.		
t-	,,	,,	*t-*	,,	,,	,,	*d-*	,,	,,	

The names in the List can be divided into four classes ; those that can be identified with certainty, those whose identification is probable or

possible, those that are unknown but are intelligible Welsh words, and those that are now neither intelligible nor identifiable. Names marked with an asterisk are hypothetical reconstructed forms, inferred but not actually found to occur as such. Unless otherwise noted the O.W. and other Welsh forms given are the direct descendants of the Br. form.

Certainly Identifiable

Cair Ligualid, Carlisle (see *Y Cymmrodor*, xxviii, 59). Br. Luguvălíon,* ' The Rampart of the God Lugus ' ; Antonine Itinerary : Luguvallo, Luguvalio. O.W. Cair Ligualid. M. and Mod. W. Caer Lliwelydd. Lugubalia in Bede and Nennius (ed. Mommsen p. 186, var. lect.) is a corrupt form from written, not spoken, sources. Luel in the *Life of St. Cuthbert* is the spoken form without its Welsh termination.

Cair Ebrauc, York. Br. Eburā́con,* either ' Cow-parsley Town ' or ' Yew-tree Town '. In primitive Celtic *eburos** seems to have meant ' yew-tree ', as in the Irish *iubhar*, but the Welsh derivative *efwr* is ' cow-parsley '. Ptolemy : Eborakon. Cassiodorus : Eboracum. Ant. It. : Eburacum. O.W. Cair Ebrauc (*Annales Cambriae* s.a. 867, Urbs Ebrauc) ; M.W. Caer Efrawc. Mod. W. Caer Efrog.

Cair Lundein (emend so ; Nennius Lundem, var. Londen, Lunden, etc. ; *m* for *in* is a common scribal error), London. Lat. Londinium, Lundinium (Tacitus, Ptolemy, Ant. It., Ammianus, etc.). The meaning and etymology of the name, and even the form and quantities, are uncertain. Ekwall, who follows Arbois de Jubainville, may be right (*Concise Oxford Dictionary of English Place-Names*, s.v.) ; but see Max Förster, *Altenglisches Lesebuch*, 4th edition, Heidelburg, 1931, p. 67. O.W. Lundein, M.W. Llundein, Mod. W. Llundain, is the regular name for London ; but it cannot be a derivative of Londinium, which would give O.W. Lennin* ; nor of Förster's Lōndinium or Lōndonion,* which would give respectively O.W. Lunnin* and Lunnein.* It is no doubt a case of early Welsh borrowing, Lundein from A.S. Lunden.

Cair Ceint, Canterbury. Br. gen. sg. Cantī,* ' (city) of Kent ' ; nom. sg. Cantion ' The White Land ', from *cantos** ' white ', or ' The Round Land ' from *cantos** ' orb, disc, circle ' (Ekwall, *op. cit.*, is inclined to accept Silvan Evans' *caint* ' plain, open country ', but this is a ghost-word). Caesar : Cantium ; Diodorus, Strabo, Ptolemy : Kantion. O.W. Cair Ceint (Nennius, ed. Mommsen p. 179 var. lect., *regionem . . . Ceint*). M.W. Caer Geint. Mod. W. Caer Gaint.

Cair Legion, Chester. Br.-Lat. Castra Legiŏnum. O.W. Cair Legion (Bede, *Hist. Eccl.* II 2, *ad civitatem Legionum, quae . . . a Brettonibus . . . Carlegion appellatur ; Annales Cambriae* s.a. 602, *sinodus urbis Legion* ; ibid. s.a. 614, *gueith* (battle) *Cair Legion*). M. and Mod. W. Caer Lleon.

Cair Guricon, Wroxeter. Br. Vricon-* (meaning ?). Ptolemy : Ouirokonion. Ant. It. : Uriconio, Virocono. See *Y Cymmrodor*, XXI, 10 ff. and 59 ff., where it is shown that the early Celtic form would be wrikon-* (*i.e.* Vricon-*). O.W. Guricon, Cair Guricon (*ureconn* for *guricon* in the 9th century poetry, see I. Williams, *Canu Llywarch Hen* p. 230) ; M.W. Gwrygon, Caer Wrygon.*

Cair Segeint, Carnarvon. Br. Segontion.* Ant. It. : Segontio, Ravennas Seguntio. O.W. Cair Segeint (Nennius, ed. Mommsen p. 166) ; M.W. Caer Seint. Mod. W. Saint, the river at Carnarvon. *Not* Caer Seion, which is a different place, see *Archaeologia Cambrensis*, LXXXIII, 357.

Cair Legion guar Uisc (emend so ; Nennius Cair Legeion guar Usic, var. Ligion, Legion, etc.), Caerleon upon Usk. Br.-Lat. Castra Legiŏnum vor Ēscā-* (cf. Chester above). Br. Ēscā,* the name of the river. Ant. It. : Isca, the town. M.W. Caer Lleon ar Wysc. The Welsh form, here and in Asser's Uuisc, the river Exe, shows that the *E* must have been long in Br. ; which raises problems of its relation to Rom.-Brit. Isca ; Engl. Exe ; Irish, esc ; not solved by Ekwall *op. cit.* s.v. Exe.

Cair Guent, Caerwent. Br. Ventā,* meaning uncertain. Ant. It. : Venta Silurum. O.W. Cair Guent. M. and Mod. W. Caer Went. That this one is meant and not one of the other two Venta's of Roman Britain, seems certain ; to a Welshman of any century there could be only one place of this name.

Cair Luitcoyt, Lichfield. Br. Lētocaiton,* ' Grey Wood '. Ant. It. : (L)etoceto, Ravennas Le(c)tocetum. O.W. Cair Luitcoyt. M.W. Caer Lwytgoed (in early poetry, see I. Williams, *Canu Llywarch Hen* p. 52).

Probably or Possibly Identifiable

Cair Guorthigirn, ' The City of Vortigern '. M. and Mod. W. Caer Wrtheyrn.* Nennius (ed. Mommsen, p. 191), *arcem Guorthigirni quae est in regione Demetorum iuxta flumen Teibi*, ' the citadel of Vortigern which is in the land of Dyfed near the river Teifi '. This is the modern Craig Gwrtheyrn above the Teifi near Llandyssul, in what was in early

times part of Dyfed (cf. the Ordnance Survey Map of Britain in the Dark Ages, South Sheet). But note ibid., p. 186, *ipse* (Vortigern) . . . *ad sinistralem plagam pervenit et usque ad regionem quae vocatur Guunnessi adfuit, et urbem ibi quae vocatur suo nomine Cair Guorthigirn aedificavit* (var. *ad septentrionalem plagam insulae Britanniae . . . ad regionem cui est nomen Guunis*). Guunnessi and Guunis are unknown and probably corrupt, but the Latin points to the British kingdoms of southern Scotland and the North of England ; ' Y Gogledd ' in Welsh, always rendered *sinistralis* (*pars*, *plaga*, etc.) in early Welsh Latin (*gogledd*= 1 ' left hand ', 2 ' north ').

Cair Guinntguic. Br. *-ent-* became *-int-* unless prevented by final *-ā*, as in Venta. If however we assume a masc. or neut. variant Ventos* or Venton* or a compound Vento-,* this would give O.W. Guint, M.W. Gwynt ; which is in fact the name of Winchester in a 9th or 10th century poem in the Book of Taliesin (Caer Wynt, B.T. 15, 23). Postulating further a Br. Ventovīcion* (cf. Longovicium, Lanchester), with the element *vīc-* which appears in Latin *vicus* ' village ', A.S. *wic* ' village, town ' (Engl. *-wich* in place-names), Ir. *fích* ' farm, town ', Breton *gwik* ' burgh ', this would give exactly O.W. Guin(n)tguic, Mod. W. Gwyntwig,* with the same meaning as Caer Wynt. May one suggest that an alternative Rom.-Br. name for Venta Belgarum was Ventovicium,* and look out for a possible A.S. Wintwic * ?

Cair Colun. Colun comes regularly from Colōnia. Of the five Coloniae of Roman Britain, York is already in the List and Gloucester in the Expanded List (in any case Gloucester could never be anything but Cair Gloiu, M.W. Caer Loyw) ; St. Alban's is improbable, as Colonia does not appear among the later names for the place. This leaves either Colchester (Colne-ceaster = Cair Colun exactly) or Lincoln (Bede Lindocolina, A.S. Lind-cylene). On historical grounds the second seems rather more likely.

Cair Caratauc. The personal name, Br. Caratā́cos,* Lat. Caratacus, O.W. Caratauc, M.W. Caradawc, Mod. W. Caradog. The various Caradogs of early Welsh story are entirely legendary. A Caer Garadog is mentioned in a poem in the Book of Taliesin apparently in connexion with the northern British kingdoms (p. 65, 3–4, *o Gaer Glut hyt Gaer Garadawc*, ' from Dumbarton to Caer Garadog ') ; and in a very old poem on Cadwallon which Professor Williams seems to think may be contemporary with him, it says *yspydawd Cadwallawn Gaer Garadawc vre wrth y gyfwyre gynne Efrawc*, ' the company of Cadwallon in the district of Caer Garadog at the stir over the burning

of York'; see *Bulletin of the Board of Celtic Studies*, VII, 25. But as with Cair Guorthigirn there are sites of this name, hill-forts and the like, in the south as well (there are more than one in Shropshire, see J. E. Lloyd, *History of Wales*, I, 53). Perhaps the most notable is that on top of the Breiddin above the Severn in Montgomeryshire.

CAIR GRAUTH. Henry of Huntingdon's identification with Cambridge presupposes a scribal error, to be emended to Grant(h), which is in itself likely enough. This is generally rejected as a bad guess, but surely with insufficient reason. The A.S. name for Cambridge was Grantacaestir (Bede), derived from the name of the river Granta which is believed to be Celtic (Ekwall's etymology, *op. cit.* s.v. Granta, is not very convincing). If not the original Celtic name for the town, Cair Grant might well be a Welsh adaptation of A.S. Grantacaestir, with the same meaning. What would the famous 'devils' talking Welsh in the Fens in Felix's Life of St. Guthlac (8th century) have called Cambridge? But historically it seems not very likely that Nennius would choose the place. In any case the Mod. W. Caer Grawnt is a pseudo-learned corruption derived from the List; Caer Grawnt would come from an O.W. Cair Craunt,* and O.W. Cair Grant would give Mod. W. Caer Rant.* In fact the real Welsh for Cambridge is the same word; cf. T. H. Parry-Williams, *Canu Rhydd Cynnar*, poem no. 21, *y rhodie i Gambridge a Rhydychen*, 'he should journey to Cambridge and Oxford', in a 17th century folk-poem.

CAIR DAUN, Doncaster? Br. Dānon,* Ant. It.: Danum, would become regularly O.W. Daun, M. and Mod. W. Dawn. But the name is otherwise unknown in Welsh for this place, except in versions of the List; and, as with Cambridge, it seems a rather unlikely place to choose at the period.

CAIR BRITHON, 'The City of the Britons', which can only mean Dumbarton. The regular Welsh name for Dumbarton was O.W. Alt Clut, Cair Clut, M. and Mod. W. Allt Clud, Caer Glud, 'The Rock on the Clyde' and 'The City on the Clyde'. But in Irish and Scotch Gaelic it is Dún (m)Bretan, 'The Fort of the Britons', whence Dumbarton. Cair Brithon (Br. gen. pl. Britton-*), M. and Mod. W. Caer Frython,* must be either a translation of this or an alternative native name not recorded elsewhere.

CAIR PENSA VEL COYT. 'The City of Pensa or Forest' makes no sense; to be read no doubt as Cair Pen(n) Savel-Coyt, 'The City of the End (or Hill) of *savel* Forest'. *Savel* is unknown, and the *v* must stand here for O.W. *u*,=M.W. *w* (there is no *v* in O.W., and

Latin *v* and *u* are of course interchangeable ; but at this early period one would have expected *gu* in O.W.—*Saguel*). O.W. *sauel* would be M.W. *sawell* ' chimney ' ; therefore ' The City of the End (or Hill) of Chimney Forest ' ? Has been identified with Penselwood (*i.e.* ' Penn in Selwood ', see Ekwall *op. cit.* s.v.), where there was a battle between Britons and Saxons in A.D. 658, Anglo-Saxon Chronicle. ' If . . . not . . . it is a very odd coincidence ', Haverfield, *op. cit.* p. 290. Exactly ; but though the *Pen* in this is the same as the Welsh *Penn*, the forest-name Selwood (A.S. Sealwuda, Selewuda) means ' Sallow Wood ', A.S. *salh* (Ekwall). Perhaps Sauel Coyt is a Welsh etymologizing adaptation of Sealwuda ; possibly vice versa, but this is less likely since ' Sallow Wood ' makes better sense than ' Chimney Wood '.

Intelligible but not Identified

Cair Mincip. Br.-Lat. Municipium would give Mincip in O.W., but there is nothing to show which of the Roman municipia is intended.

Cair Custeint (emend so ; Nennius Custoeint, var. Custeint, Gustaint, etc.). The Latin Constantius became Br.-Lat. Cōstantius, and this gave O.W. Custeint (*not* from Constantinus, which gave Custennin). Which Constantius, and where his city was, is unknown. Welsh tradition connects a Constantinus, though which one is not very clear, with Carnarvon (Nennius, ed. Mommsen p. 166, *Constantinus Constantini Magni filius fuit, et ibi moritur, et sepulcrum illius monstratur iuxta urbem quae vocatur Cair Segeint, ut litterae quae sunt in lapide tumuli ostendunt*), but as Cair Segeint occurs already in the List some other place is to be looked for.[1]

Cair Maunguid. A Br. Mānovid-* would become O.W. Maunguid, Mod. W. Mawnwydd,* ' Bog Forest '.

Cair Peris. Seems to contain the same name as in Dol Peris, Llanberis, in North Wales. The single *-s-* of Parisii shows that it is not Petuaria ; Parīssī would give Peris exactly.

Unintelligible and Unidentified

Cair Meguaid. The spelling could stand also for O.W. Miguaid ;* Mod. W. Mewaedd,* or Mywaedd.*

[1] In the 12th century ' Life of Gruffydd ab Cynan ' Carnarvon is called ' City of Constantine the Emperor, son of Constans the Great '. The tradition arises no doubt out of an early Latin inscription to some Constantinus otherwise unknown, but later equated with Constantine the Great or his son. Cf. I. Williams, *Breuddwyd Maxen* (Bangor, 1920) p. xix.

Cair Guiragon. Can stand also for Guirangon* ; cf. *Gwenhwys gwallt-hiryon am Gaer Wyragon*, ' The long-haired Gwent-men around Caer Wyrangon ', in a poem in the Book of Taliesin, 41.25. Identified by Henry of Huntingdon with Worcester. There are no grounds for this ' except ', as Haverfield says *op. cit.* p. 291, ' that both contain the same consonants in a different order '. Worcester is from A.S. Wigorna-ceaster (see Ekwall, *op. cit.* s.v.), ' The City of the Wigora People '. Wigora from a Br. Vigorā,* a river name (cf. several Gaulish rivers Vigora, see Holder *Altceltischer Sprachschatz* s.v.) ; and this would give Guigor* in O.W., not Guira(n)gon. The B.T. passage suggests that Cair Guiragon was in Gwent ; unless indeed it was written when Henry's ideas had already become current in Wales, under the impression that Caer Wyrangon really was Worcester. Cf. however Nennius, ed. Mommsen p. 179, *Guorthigirnus dedit laete illis* (Hengist and Horsa) *regnum Gurangona ;* var. *et dedit illis Guoyrancgono regnante in Cantia.* Did Nennius mean somewhere in Kent by Cair Guiragon ?

Cair Lerion. Looks like a plural in *-ion* ; the spelling can stand for Leirion* from Br. Larion-,* Lerion-,* or Lorion-,* or for Lirion (Mod. W. Llyrion*) from Br. Lirion-.*

Cair Draitou, var. Draithou, etc. Obscure.[2]

Cair Urnarc, var. Urnach, etc. Urnarc is unlikely ; a M.W. personal name Wrnach occurs in the Mabinogion of a fairy-tale giant who has a *caer*.

Cair Celemion, var. Celeimon, Celemon, etc. A pl. in *-ion* ? Spelling must represent Celeimion ; or, with scribal error, Celeinion. Cf. M.W. *celein* ' a corpse ' ?

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[2] Since writing the above, Mr O. G. S. Crawford has drawn my atttention to Cott. Vesp. MS A. XIV, f. 93b (Vita S. Carantoci), *in istis temporibus Cato et Arthur regnabant in ista patria, habitantes in Dindraithov.* W. J. Rees' notoriously corrupt edition, *Lives of the Cambro-British Saints*, p. 99, reads Dindrarthou ; Dr C. E. Wright, of the British Museum, writes 'After careful consideration I am certain the reading . . . is Dindraithov'. Din Draithou, ' Citadel of Draithou ' (Mod. W. Din Draethau* ?) is evidently the same as Cair Draithou ; the context shows that it was in Cornwall. *Dind Tradui* of Cormac's Glossary (s.v. *Mugh Eme*) is the name of some early Irish settlement in Britain ; possibly the same as Din Draithou, but on phonetic grounds the identification is doubtful. To read Din Traithou,* ' Citadel of the Beaches ', would give sense and help this identification ; but *din* would not cause mutation, and mutation after Cair is not found in spelling in the list.

The Expanded List

Of the five extra names in the enlarged list of thirty-three cities, two are certainly to be identified, one probably, one very doubtfully, and one is unintelligible and unknown.

Cair Merdin, Carmarthen. Br. Moridūnon,* ' Sea Fort '. Ptolemy Maridunon, Ant. It. Muriduno. O.W. Cair Merdin, M.W. Caer Fyrdin, Mod. W. Caer Fyrddin. Now understood as ' The City of Merlin ' (Myrddin).

Cair Gloiu. (The reading of Brit. Mus. Harl. 3859 is Gloiu, not Gloui as so often transcribed), Gloucester. Br. Gloivon,* ' Bright '. Ant. It. : Glēvo. O.W. Cair Gloiu. M. and Mod. W. Caer Loyw.

Cair Ceri, Cirencester ? (Asser, chap. 57, *Cirrenceastre adiit, quae Britannice Cair Ceri nominatur* ; Book of Taliesin 15.3, Kaer Geri, in a 9th or 10th century poem). Ptolemy Korinion, which if the first *i* is long would give regularly Cerin in Welsh, not Ceri. An original scribal error with Cerī (*i.e.* Cer*in*) misread as Ceri, seems possible. See however Ekwall, *op. cit.* s.v. Cirencester.

Cair Gurcoc. A Br. Virococ-* would give O.W. Gurcoc.

Cair Teim. A Br. *Tamī*,* with the element *tam-* common in river names (Thames, Teme, Taf, etc., etc.), would become O.W. Teim. Cair Teim could possibly be Llandaff (O.W. Lan Tam) with an early stereotyped gen. sg. form Teim, nom. sg. Tam. For such stereotyped genitives, cf. Maelgwn (properly orig. gen. sg.) beside Meilyg (properly orig. nom. sg.), from Br. Maglocū,* gen. sg. Maglocunos.*

These names of Nennius' List bear on the stamp of genuineness. The kind of thing that happened when Welsh antiquaries set about inventing names is seen well enough in Geoffrey of Monmouth's writings. But the Nennian forms are in quite a different category ; they are not fictitious, nor are they antiquarian Welshifyings of real Latin and English names, for they fit too well into the recognized rules of Celtic philology, and if we cannot understand a few of them it is due to our own ignorance or to scribal miscopying. Plainly these were more or less well-known place-names written down correctly from the spoken Welsh of about Nennius' own time ; and some of them were derived directly, by the ordinary processes of linguistic change, from good British and British-Latin forms known to us independently from other sources. Where were they found, and on what principles were they compiled ? Haverfield, who was always inclined to do Celtic sources less than justice, says of them (*op. cit.* p. 290) ' the list may have

been composed . . . by a Celt who knew Wales well, who perhaps knew the other Celtic districts of Britain a little, and who shared the notorious ignorance of his fellows concerning the eastern English districts '. This very inadequate view was arrived at by picking out those names that belong to Wales and the border, ignoring the unmistakable evidence of Cair Ceint and others, and using unnecessary caution over Cair Lundein and Cair Colun. One may agree with Haverfield however where he says (p. 289) ' Plainly it belongs to a Celtic and not to a Roman world : it is neither a list handed down from Roman times nor a translation of such a list '. True, a fair number of its cities were more or less important places in Roman Britain, such as York, Chester, Caerleon, Carlisle ; but these all continued to be so right through the Dark Ages, either in fact or in common Welsh tradition. For the rest, so far as they are identifiable they are mostly places of no significance whatever in Roman times, such as Craig Gwrtheyrn (if this identification is correct) and Dumbarton. Of the twenty or twenty-one Roman towns which, as Mr Stevens has shown, probably did belong to a genuine Romano-British register of twenty-eight cities known of by Gildas, only eight are found in the present List—Carlisle, York, London, Canterbury, Caerwent, Winchester (?), Lincoln or Colchester, Wroxeter ; with three more from the Expanded List of thirty-one—Carmarthen,[3] Gloucester, Cirencester (?).

It is evident that the Welsh List was made up on some quite different basis. In fact, the compiler knew from Gildas and Bede only so much—that there were traditionally twenty-eight important cities in Britain, not their names, and so he set to work to supply these names from his own sources. There seem to be two ways in which he could have done this. He could have chosen twenty-eight of the chief centres of his own time throughout Britain, both Saxon and British ; or, knowing that the twenty-eight cities belonged to a Romano-British past, he could have picked them from the famous British traditions and legends of the old days, places not necessarily of any contemporary importance when the List was made. In support of the first, it is notable that the main divisions of Saxon England in the Dark Ages, as well as the British areas, are fairly well represented with existing centres of more or less prominence, as would be expected on this hypothesis. For Northumbria, Carlisle, York, and Doncaster (?) ; for Lindsey, Lincoln (?) ; for Mercia, Chester and Lichfield ; for Middle Anglia,

[3] But Mr Stevens is very doubtful whether Maridunum should be included.

Cambridge (?); for Essex, Colchester (?) and London; for Kent, Canterbury; for Wessex, Winchester (?) and Penselwood (?). Dumbarton, Caernarvon, Caerleon, Caerwent, were well-known in the Welsh lands at the time. It is even possible in one or two cases that Anglo-Saxon forms of names were adopted; see Cair Grauth and Cair Pensa vel Coyt above; and in the case of Cair Lundein it seems very probable.

But certain arguments can be put forward in favour of the second method of compilation. As cities, Craig Gwrtheyrn and Caer Garadog, though real places, belong purely to legend (if the southern identifications are accepted), and so no doubt do most of the unidentified places on the list. Carlisle, York, Chester, Wroxeter, Lichfield, Canterbury, Dumbarton, and the Welsh towns can all be found in early Welsh tradition, either in the poetry or in Nennius, as places of ancient fame. It is odd in this case that the Caer Eidyn (Edinburgh), so famous in the early Welsh classic the Gododdin, should be left out; and one might have expected to find Cair Badon* and some of the other places believed at the time to have been connected with king Arthur. In some instances the obvious remains of Roman occupation may have helped in their inclusion; Wroxeter is an example; and in others, such inadequate information as Nennius had about Roman Britain from Latin sources. The compiler seems to have understood the significance of Gildas' *civitas* sufficiently well not to include places which come into prominence late as Christian monastic settlements only, not as civil or military centres; such as St. Asaph's, Bangor, Clynnog, Llanbadarn, St. David's, and many others.[4]

The truth is no doubt that Nennius worked on both methods. A certain number of places would be an obvious choice on all grounds, both for their past prominence in tradition and for their greater or lesser importance at the time; Carlisle, York, Chester, Carnarvon, Caerleon, Caerwent, Lichfield, Dumbarton. With others, Roman remains plain to see may have made it clear that these were once great cities,[5] though no longer necessarily of much fame; this may be the case with Wroxeter, the doubtful Doncaster, and the exceedingly doubtful Cambridge, as well as for some of those for which no identification can now be proposed, *e.g.* Cair Mincip. Others would be included because they were supposed to be connected with famous British

[4] This makes the equation Cair Teim—Llandaff even more uncertain, though in the later Expanded List the significance of *civitas* may have been forgotten.

[5] Cf. Giraldus Cambrensis on Caerleon, It. Kambr. 1, 5.

heroes, though no trace of a city was necessarily visible or ever had been ; Craig Gwrtheyrn and Caer Garadog perhaps come in here, and possibly Caer Gustaint, and the very doubtful Penselwood if any tradition of the battle of 658 was known in Wales at the time. Still others might be included primarily for their present political importance, though some of the foregoing reasons would apply to them as well ; this would cover London, Winchester, Canterbury, Lincoln (?).

The conclusions are then as follows. Of Nennius's List of twenty-eight cities, ten are identifiable with certainty (and two more from the Expanded List), eight can be pinned down with some extent of probability or possibility (and two more from the Expanded List), and ten cannot be identified at all (one more from the Expanded List). These cities are certainly not to be regarded as taken from any official Roman ' Notitia ', though Mr Stevens has proved that the conception of the twenty-eight cities does very likely come from such a document. It appears that Nennius set to work to supply names for what he fully understood to be primarily twenty-eight cities belonging to the great past of his people, and owing to a misreading of the figures this was at some time increased to thirty-three. He drew on any sources which he could ; first of all on Welsh tradition, reinforced perhaps by popular archaeological observation and a smattering of Latin learning, and then on what he knew of the prominent centres all over Britain in his own time. In later ages the resulting list was taken up by English and Welsh antiquaries, and in Wales enjoyed a vogue throughout the Medieval period. These late identifications however are worthless except in those cases where they are obvious, because they are based on the guesses of pseudo-scholars like Henry of Huntingdon and Geoffrey of Monmouth, and not on any genuine old native tradition.

The Use of Bone Implements in the Old Palaeolithic Period*

by the Abbé H. Breuil

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IT was Boucher de Perthes and some of his precursors who originated the idea of an age of worked stone : previously the only stone implements recognized as such were polished axes, arrowheads and a few particularly well-made flint knives. On the other hand it is generally agreed that, besides worked stone, which as a rule is all that has survived, fossil man must have used wood for many of his weapons and implements ; though with the exception of a pointed stake from Clacton (preserved in peat with remains of *Elephas antiquus*) nothing made of this material is known until we come to the neolithic pile-dwellings. Mainly as the result of the excavations of Lartet and Christy in the Dordogne (1863) it was learnt that hard animal substances such as bone, ivory and deer's horn, which were preserved by the limestone matrix of caves and rock-shelters had also played a large part in the industrial activities of man. This already advanced industry must have been far removed in time from the first utilization of bone, for it shows a technique that is highly developed—a technique in which the splitting of bone is first associated with and then superseded by sawing with gravers and smoothing with scrapers. There can be no doubt therefore that the stilettos, spear-heads, etc., of the Later Palaeolithic period must have had more ancient prototypes of worked bone. In fact the only Middle Palaeolithic examples known today of bone-working by means of attrition and scraping are few in number—rib-bones sharpened by rubbing, occasional awls similarly sharpened—and the two large spear-points from the Upper Mousterian of Castillo (Spain) and La Quina (Charente, France). To these, though they are

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PLATE I

CHOU-KOU-TIEN

1. Shaped frontal bone of *Cervus curyceros pachyosteus* from which the antlers have been cleft.

2–6. Frontal bones of *Cervus pseudaxis grayi* treated in the same way except 6, where the right antler is cut off above the burr. Transversal cuts can be clearly seen on the 2 pedicles; they are less visible on 3. The two pedicles of 4 and the left one of 5 have been considerably reduced artificially.

5. The reverse of one of the frontal bones on which the rim of the cavity has been carefully shaped by trimming.

7. Part of the upper maxillary of the 2nd stag, the broken edge has been trimmed like a flint tool.

facing p. 56

HORNS OF *CERVUS PSEUDAXIS GRAYI* OF CHOU-KOU-TIEN, SEVERED BY MAN

1. At the base of the artificially reduced pedicle, the frontal tine and principal shaft cut through with a stone tool.
2–3. The chief shaft broken across artificially and the frontal tine showing incisions produced by the use to which it was put.
4. Chief shaft severed with a stone tool; the break at the frontal tine is recent. Parts of the frontal bone at the base of the pedicle in 3 and 4 are reduced by trimming.

PLATE III

CHOU-KOU-TIEN

Broken pieces of stag and horse cannon-bones. The broken end has been made use of, this can be seen by the localized wearing down of the point of 5, 8, 9, 10, 11. Most of these points have been shaped by trimming just like a stone tool. 1 and 7 may have served as chisels or wedges ; the transversally shaped end is obviously splintered by use.

PLATE IV

CHOU-KOU-TIEN

Flakes of long bones of which one end (and two of no. 14) have been trimmed to a point, often with two small lateral shoulders

the products of a different technique, one might add the anvil-blocks and trimming-tools from the same strata described by Dr Henri Martin. They were made by utilizing such things as splinters of broken bone, the heads of *humeri* fashioned by percussion or the unaltered phalanges of ox and horse. We should also mention—though we shall deal with them more fully later—the jaws and other bones of the great bear, broken so that they could be held. These were first observed by Garrigou in the Pyrenean caves, but have been found chiefly in Central Europe, where man hunted those animals in their dens. Speaking generally, however, the idea of an extensive use of bone in the Old or Middle Palaeolithic period is not yet accepted by the scientific world.

But he who thinks must recognize the fact that suitable stone, such as flint, hard sandstone, quartzite, quartz, hard limestone or the various kinds of igneous rock do not occur everywhere, and that, to be made into useful implements, they require the application of a complicated technique of chipping and secondary working—and this postulates a long period of experiment before it can be developed. Certain experts have therefore, put forward the suggestion, that before the Age of Stone there was an Age of Wood and Bone ; this view is reasonable if somewhat theoretical, for it is difficult to see how such work could have been possible without the use of sharpened stone.

Let us go back in thought, then, to that dark dawn of the industrial phase of Man. We find him or his intelligent ancestor, surrounded by animals better armed by Nature than himself, lions and bears with teeth and claws, grass-eaters with horns and antlers. What more natural than to rob them of these weapons to use against them ? Ever a hunter, Man had round him the skeletal remains of his victims, quickly unfleshed by himself, by carnivores and by natural agencies. He also encountered on his wanderings the cast antlers of deer and the carcases of the carnivores' prey. Some of the complete longer bones made excellent clubs with handles not easily broken ; some of the bones could in their natural state be used for pricking and piercing holes ; some large and flat could be used as shovels ; others which were longer, as levers ; yet others which were short and stout might suggest an anvil or a hammer, while such as were broad, thin and trenchant, when grasped, became scrapers and planes.

When Man, armed with a pebble, broke long bones to extract the marrow, like a hyaena, they broke in different ways. Some had articular ends convenient for holding if man wished to use them as

implements, while the other end was pointed. Others, pieces of diaphyses, had ends that could be used as points or chisels and cutting edges which could serve as knives or scrapers. Unlike the hyaena, Man often broke the bones lengthwise.

Stag-horn recovered from slaughtered animals or picked up on the ground, the natural long bones of dismembered carcases, fragments of bone artificially broken, were everywhere at hand for the use of our remote ancestors ; they were a form of raw material that was at once both springy and resistant, a kind of animal *stone*, the natural shape being adaptable, or a kind of *wood* more resistant than that of trees.

Fossil man must certainly have made considerable use of bone as well as of wood and stone, particularly where the two last were not naturally available or were difficult to obtain ; and he must have employed the technique of percussion used for making implements of stone, or of cutting, as for wood.

But the reasonableness of an idea is not enough for us to be able to check its correctness by the material facts of observation. It is morally certain that the first men who used stones, before learning to work them, must have used the cutting stones provided by the beds of flints split into fragments by sun and frost ; but we are as yet unable to distinguish such objects from the others, countless in number, with edges retouched by natural mechanical causes.

Are we more fortunate in the case of worked bones ?

We must first eliminate causes of error, and discover what Nature can do to bones submitted to her action, and first of all to the action of carnivores or rodents.

A dead animal lying on the ground immediately becomes their prey ; but only the hyaena has been provided by Nature with teeth that can split fairly big bones, so as to devour not only the marrow, but also the actual bone-fragments. The resulting fracture has some resemblance to that obtained by man when he breaks a long bone crosswise by placing it upon a stone and hitting it ; but it is characterized by certain cup-shaped depressions caused by the teeth. Bones too bulky to be held between the jaws are gnawed by the incisors and canines at the ends or on the periphery. A disc of this kind of the nasal bone of *Rhinoceros tichorinus* is in the Manchester Museum ; it was gnawed by a hyaena whilst the horn was still attached, protecting the adjacent part.

Such a method, which can be produced by other carnivores—especially the wolf—according to their more limited capacities, give

the long bones, too strong to be broken, extremities which are half chewed and narrowed, thus producing an illusion of human workmanship. Many marrow-bones deprived of their epiphyses, after this gnawing of their softer ends, seem to have been cut across ; but the marks of incisors and canines are visible, and by measuring their distance apart, the size of their consumer can be discovered. Canines can cut into the ends of the diaphyses more deeply on their axial line than on the sides, so that they assume the form of a two-pronged fork ; when this occurs at both ends, the result is an object which looks like a shuttle, and more than one prehistorian has fallen into the trap.

Although all animals without exception, even ruminants, will attack fresh bone and horn—and in South Africa that is one of the causes of the spread of epizooties—it is the rodents which concern us here, particularly two kinds who ' worked ' in the Old World during the Quaternary Period—beavers and porcupine. But all rodents, either from a hunger for bony substance or to sharpen their incisors, habitually gnaw the bones they meet with, from the marmot and hare to the squirrel and humble mouse. To cut into a bony surface, all these animals drive their lower incisors into the surface to be gnawed more or less at right angles to it, and cut into it with their upper incisors. The former of the two impacts leaves only slight punctuated marks, whilst perfectly clean long gashes generally arranged in pairs, represent the marks left by the upper incisors. If the animal shifted its position laterally, there are a number of parallel incisions ; but if it remained longer in one position, moving its head to each side in turn, it produced a fan-shaped pattern of incisions. When instead of small or medium sized rodents, beavers or porcupines have been at work, the width of the gashes, their depth and distinctness recalls the marks left by an implement of hardened steel. These marks suggest human workmanship, particularly in the three following instances :—(1) at the end of a bone or fragment of bone, when the incised facettes produce a worked pseudo-point. An instance of this is the bone claimed to have been worked by the Piltdown man, but whose author was really a big species of beaver, perhaps Trogontherium. (2) A second instance is the gnawing of a skull-top which may appear to have been made into a cup, as in the case of a human skull found in a cave near Cape Town. (3) A third instance occurs when peripheral gnawing of a flat bone has produced a complicated shape, apparently intentional, such as I have observed in the case of a flat bone from the caves of Tsitsikama, now preserved in the museum at Port Elizabeth ; this at first sight

appears to have been cut by man in a triple lobed symmetrically notched shape.

It may therefore be stated that fresh bone can either be broken by hyaenas, or gnawed at the end by wolves, or incised, but not broken, by rodents. We do not include cases where animal-bones have been broken by a fall, or marrow-bones thrown from a height on to rocks by lammergeyers.

Let us return to the bones only partially consumed by animals ; those left on the surface are dissolved and quickly disappear, and the same thing happens to those which are buried in siliceous soil that is permeated by rain-water. Those buried at a shallow depth in soil covered by vegetation are attacked by roots, which cover their surface with a tangled and complicated network of hollow lines.

All buried bones gradually lose their gelatine ; from being firm and coherent they become porous, and split lengthwise ; and their concentric layers tend to scale off. If an attempt is made to break them when they are in this condition, they crumble and fall into fragments with indented edges ; they are no longer elastic and resistant. This does not exclude the possibility that burrowing animals, digging their earths, may not leave on bones the marks of their claws and teeth ; but one can see by the look of the surface attached that such have been produced on a fossil bone that was not usable by man. Attention must be called, however, to false trepanning, or to such genuine instances as have been enlarged by mice seeking to make an exit, after having entered a skull by the occipital orifice.

In this first stage of fossilization, the organic matter of the bone has more or less disintegrated, and the bone has acquired a porous consistency which makes it ready to absorb those mineral salts which at a later stage will gradually petrify it. When this fossilization is far enough advanced, it again becomes coherent, but not elastic ; usually the interior will have a different colour from the exterior, being darker, except in the case of burnt bone, whose external surface becomes white again (or blue in certain special cases), whilst the interior becomes black. It may happen that Man will try and work these highly fossilized bones, as if it were some sort of stone ; but at this stage the only natural mechanical agency involved—and it *is* involved—is soil subsidence ; when this occurred in the previous stage, the bone is broken and crumbles ; in the other it is cleanly fractured, or striated during solifluxion, but it remains unsuitable to serve as a raw material of human industry. We may therefore ignore it.

Except for fossils made into pendants for ornament (teeth of large fossil bears, pierced by the Aurignacians of Gargas) only fresh bone could have been used by Man ; so that the only causes of error we have to anticipate are, for fractures, chiefly the hyaena ; for blunted ends the same animal and the smaller carnivores ; for sharp incisions, the large rodents, and beaver. To these may be added : for broad superficial marks, those produced mechanically by rolling ; in caves, by the going and coming of animals, and the generalized solutions of soil not sufficiently calcareous, these being often strangely penetrating (producing sometimes well formed holes).

Let us now consider the use made by palaeolithic man throughout the ages of some slightly modified parts of his victims' skeletons. Taking into account the reports (mainly German), bearing on the lairs of the cave-bear, which Man visited on hunting expeditions, we shall rely mainly on evidence derived, on the one hand from the lower deposits of the cave of Castillo (Santander, Spain), excavated by H. Obermaier, P. Wernert and myself ; and on that, so carefully collected, in the Chinese excavations of Chou-kou-tien, principally by my friend and fellow-worker W. C. Pei. Occasional reference will be made to the still older site of Ni-ho-wan, and to the later one at the bottom of the great loess formation of Choei-Tong-Keou, investigated, like the preceding one, by Fathers Licent and Teilhard. Beginning with the head and its attachments, we proceed to the members and trunk.

Horns of ruminants.

Those of large dimensions do not appear to have attracted human attention, though one might expect them to have removed the horny sheath from the core. It is the same with the big Ibex, except for a Mousterian frontal bone from Pocola, Istria, which has a horn-core cleanly cut with a flint at some distance from its base (Trieste Museum). The horn-core of a small bison from Chou-kou-tien seems to have been sectioned ; a skull of *Boopsis Sinensis* (cf. Musk-ox) also from Chou-kou-tien has clearly had its two horns removed with a sharp tool.

The horns of slighter animals, on the other hand, have been much sought after in all periods ; but they are rare at Chou-kou-tien, whence come only two cut gazelle-horns, and the skull of Spiroceros, with a horn cut off halfway up. At the present day, the Mongols use gazelle-horns as daggers. In the Ordos sites and at Ni-ho-wan, where they are common, they were also so used, and those parts of the skull which were inconvenient for the grip were knocked away. The same thing

occurred in Algeria, Palestine, and at Le Placard (Saiga horns) and other sites in the Upper Palaeolithic.

Deer-antlers.

Young or small antlers were worked at Chou-kou-tien like those just described ; either the pedicle was cut by stone implements, or the skull-part remaining attached was knocked away.

More bulky antlers had to be cut up, so at Chou-kou-tien and at Ordos, the tines to be sectioned were first slightly burnt, and then attacked with stone chisels, a groove being cut, usually on one side only ; then the horn was broken off roughly by pressure (PLATE II). This technique of Chou-kou-tien and Ordos occurs also at La Quina for reindeer-horn, in the Upper Mousterian, and also, for deer-horn, in the Mousterian and Premousterian levels of Castillo. It had been found before in the Sammenian of Ni-ho-wan. The fragments thus removed consist mainly of points of tines, the ends and round surface very often having on them scars and marks resulting from use. Sometimes it is clear the end is worn by use, and some scraping is intended to re-sharpen the blunted point. Such objects persist throughout the Stone Age.

The middle and end parts of heavy antlers, still retaining one or more tines, the shaft forming the handle, occur in the neolithic flint-mines and at Chou-kou-tien, Ordos, etc.

Chou-kou-tien and Ordos have yielded a great number of basal parts of antlers, mainly from shed horns, whose shaft was used as a handle ; their burr shows that they were used as hammers. Other bases, cut short, were used for grinding.

Some medial portions whose spongy part seems to have been scooped out, were therefore probably used as hafts.

Skulls or parts of skulls.

At Chou-kou-tien as in Ordos and at Castillo (Mousterian) and in the loess of Alsace, the cavity of the frontal bone has been carefully battered (from the outer surface of the skull) into a regular form, the antlers having been cut off (PLATE I). It is possible that, originally, the object of this procedure was to reduce the weight of the antlers that were carried back to the camp ; but quite often the stumps have been reduced as much as possible, as if to make a little cup ; and burning has sometimes been used to achieve this. An identical technique occurs on other brain-pan fragments at Chou-kou-tien. In the upper level, part of a skull-cap of Sinanthropus thus worked was found, whose outer surface

is scratched and polished by use. These deer-skull-cups are also often worn on the edge. Such marks are found too on human crania of the Solutrean and Magdalenian periods from Le Placard, where they were used as cups.

Certain parts of the skull, such as the occipital orifice with its articular ridges, are often isolated by careful peripheral trimming.

Jaw-bones.

A long time ago, Dr Garrigou suggested that the lower jaws of the great bear were used as tools or weapons after their projecting portions had been knocked off. Two examples, presented by him to the St. Germain Museum, have actually been worked in that way, and the part that must have been held in the hand is noticeably worn and burnished, in contrast to the rest of the bone. The same thing can be observed at Chou-kou-tien in a series of mandibles of boar and jaw-bones of a large feline, the two parts still joined.

This is much less certain in the case of the jaw-bones of a very large type of hyaena from this site. The mutilation of the jaw-bone is here often a natural process, due to a spontaneous fracture whose point of origin is a longitudinal splitting of the bone at the beginning of its fossilization. Later the pressure of soil has separated the parts. I pass over the probable use, at Chou-kou-tien, of the snout of a large feline with its two canine teeth, or (as rasps, etc.) of the lower or upper jaw-bones of Cervus.

On the other hand I can record that many very strong and complete mandibles of *Cervus euryceros pachyosteus* from Chou-kou-tien had been used just as they were, the horizontal part serving as a handle and the point of the coronoid apophysis (which has thereby often been slightly blunted) serving as the active part.

I may mention in passing that in the very ancient Acheulean deposit of Torralba (Soria), the disposition of the lower jaws of *Elephas antiquus* around certain spots seems to show that they were used as seats.

Long bones.

At Chou-kou-tien an enormous humerus of rhinoceros seems to have served as a bench on whose flat surface something was cut with stone ; whence it comes that its surface has many interesting slashes. But we are mainly concerned with broken bones.

Spongy lumps from the heads of thigh-bones and humeri, and even

of short bones such as vertebrae, have been practically peeled and used to rub down something, perhaps to polish and at the same time to grease leather or wooden handles ; this is particularly noticeable in the Upper Palaeolithic.

Articular ' apples ' have frequently been removed and shaped as sling-stones from Chou-kou-tien till the end of the Upper European Palaeolithic.

The distal ends of radius and tibia have been treated so that the medullary cavity can serve as recipient. From Chou-kou-tien till the end of the Upper European Palaeolithic.

Long bones of all kinds, especially humeri and cannon-bones broken transversely, have had their broken edge retouched just like a flint, either as a point or a chisel edge ; this has often been worn and splintered by use right up to the articular end, which was used as a handle (PLATE III). In other instances a retouched transverse fracture has had its edges regularly trimmed, and seems to have been used as the handle of a tool inserted in the medullary cavity. These facts may be observed at Ni-ho-wan and at Chou-kou-tien up till the end of palaeolithic times and even down to the historical period.

The convex distal or proximal ends, the stump of the diaphysis treated or removed by percussion, have been often worn very considerably on their articular surface, for an unknown purpose. This is almost unknown to me, except at Castillo (Santander), where it appears slightly at the end of the Aurignacian, has its maximum development in the Middle Solutrean and extends down to the older Magdalenian. There are a few rare examples at the same levels in the Dordogne.

The ulna and humerus bones of the great bear, converted into sharp pointed implements and daggers, abound in all the caves where Man hunted him. In the same way, stilettos (metapodes) of ruminants or equidae were used, almost without modification, except that produced by use in every period, as also were the ulnae of the smaller carnivores and of hares.

Fragments of diaphyses which were not split and whose broken ends were trimmed, may have been used as handles. The very big bones could only have been used, as blocks or working tables, after flakes had been detached from them by hard blows. There are a few such flakes at Chou-kou-tien and Ni-ho-wan, but they are numerous in the Moustero-aurignacian of the Ordos and in the Mousterian and lower levels of Castillo (Spain). They were roughly re-chipped and retrimmed like stone flakes. The long and relatively straight flakes from

long bones split by Man, which abound in all the sheltered sites where he lived, were generally used from Ni-ho-wan and Chou-kou-tien, to the Ordos, and in all the sufficiently protected levels of the Old Palaeolithic, especially at Castillo (Spain). They continued to be used in the Upper Palaeolithic and probably still later. Some of them have been re-trimmed at one or both ends like flint, to sharp or blunt points, or as chisels or scrapers (PLATE IV). Often, as in the preceding instances, the used part shows—besides the re-touching, which is sometimes absent—a strictly localized worn surface or a very definite splintered crushing.

Many of the narrower examples have both ends splintered and appear to have been used as chisels or punches. This type, so common at Chou-kou-tien, exists as late as the Azilian of Scotland, where its use as a flint-flaker is obvious. It has been found, with the same signs of wear, on sites of the latest (certainly Red-skin) stone age in North America. Other flakes of long bones are carefully worked on one or both sides, generally on the inner surface, and seem related to scrapers.

These oblong fragments were often selected by the Mousterians and the men of the Upper Palaeolithic as tools for pressure-flaking flint, as Henri Martin has shown.

Short limb-bones.

These are ankle-bones, heels, wrist-bones, tarsal bones and foot-bones (phalanges) of pachyderms and ruminants.

The phalanges of horses, bison and even reindeer of La Quina (Upper Mousterian) were used, as Henri Martin has shown, as anvils, probably in the working of flint and wood. Rare examples occur elsewhere (Castillo, Montières).

Ankle-bones, I do not know why, are not so frequent at La Quina ; but at Chou-kou-tien, and above all in several ancient levels at Castillo, there are many examples, mainly of Cervidae, occasionally of the larger Bovines, which have been worn down and the angles often crushed or even broken by a powerful mechanical force for an unknown purpose. The heel-bones often have the part opposed to their articular surface cut off by an oblique fracture ; this I should interpret as the result not of use, but rather of the tearing off of the Achilles tendon to make use of its fibres.

Shoulder and iliac bones.

Shoulder blades of moderate size are still used by many primitive peoples as shovels, or, sharpened, as knives. It is probable that this

has been so at all periods, but the bad preservation of the thin blade of the shoulder-bone in ancient deposits makes it difficult to prove.

It is easier to observe that very often the cup-shaped articular surface of the shoulder-blade has been isolated by fracture or by percussion and chipping ; this has occurred from Chou-kou-tien to the older levels of Castillo and as late as the Upper Palaeolithic. It often happens that the broken part has been worked to a point that is capable of being stuck in the ground.

As for the iliac bones, since the days of Chou-kou-tien, and in the Mousterian and older levels of Castillo, and during the whole of Upper Palaeolithic times, the coxal cavity was fashioned into a saucer ; either it was cut closely all round, though this was rare, or the approaching branches were cut across and re-trimmed by blows till a tripod was formed. Some of these hollows have deep scratches on their sides.

Trunk-bones.

Ribs of the size of ox and horse have been variously used from the time of the Mousterian of La Quina and Castillo ; some are sharpened very carefully at the end. The other rib-fragments, from the same sites, often show traces of hard blows at one end, the other being much blunted or rounded by use.

Shorter fragments are frequently of a rather uniform length, showing deliberate intention ; this is also the case with the long apophyses of dorsal vertebrae of Bison.

Those vertebrae which possess a marked articular cavity have often had the other parts struck off. The ring formed by certain cervical vertebrae has also sometimes been similarly isolated by the removal of the projecting portions. This occurs sporadically from Chou-kou-tien to the Upper Palaeolithic.

Such are the most obvious uses of the bony skeleton of animals. As can be seen, many are not confined to the Old or Middle Palaeolithic, but continue down to the Upper Palaeolithic and even beyond. There is nothing at all extraordinary in this ; indeed it is in agreement with the teaching of comparative ethnology. Thus I have heard that in recent excavations of ancient Eskimo sites, the number of tools consisting of slightly worked bones is very considerable. But this is a fact that can hardly be authenticated on the open sites in our own country, where bone is either not preserved at all, or preserved only in a sorry state.

THE USE OF BONE IMPLEMENTS

With the exception of the great loess deposit of China which by its great thickness has preserved bone remarkably well, one must, to have it in a condition that allows of proper consideration, resort to caves or well protected rock-shelters.

Was there originally, as Professor Menghin suggests, an Age of Bone (and Wood also, I suppose) ? One cannot affirm it absolutely. But certain indications at Ni-ho-wan and Chou-kou-tien may incline us to believe at least that, at some ancient epoch, the use of bone may have been of more importance than the use of stone.

But it is possible that this is merely a single instance of a more general observation ; in the West, at the Mousterian period, the importance of bone used as raw material is, in a number of regions poor in good working-stone, in inverse ratio to the latter. It is an ' animal stone ', mainly worked by percussion like any other stone, and, as regards antlers and horn, like a ' piece of wood '. Only this material more often than not has been destroyed or too much abraded in a soil unfavourable for its preservation, and that is why the existence of a bone industry contemporary with the old Stone Age has generally passed unnoticed, or very imperfectly observed. Perhaps also untoward publications of bones worn by natural agents, or gnawed, has contributed to cast discredit upon the genuine bone implements of these very remote epochs.

An Ancient Chinese Capital[1]

Earthworks at Old Ch'ang-an

by Carl Whiting Bishop

Freer Gallery of Art, Washington

NOT least in interest among subjects of archaeological study is that which has to do with the types of fortification constructed by organized communities in the past. These, once the habit of town-dwelling had become fixed, seem to have tended to fall into two major classes : the *arx*, acropolis, or citadel, one of whose functions it was to provide a temporary refuge in emergency ; and the *enceinte* or city-wall proper, designed to afford permanent protection to the group living within it. Sometimes the two forms occur in combination ; more often, singly.

The first type we frequently, though by no means always, find situated on a height ; the acropolis of Athens and the Capitoline Hill at Rome are familiar examples. The second class, on the other hand, seems to have developed more especially in those alluvial plains on which sprang up the great river-valley civilizations of the Ancient World. To it belong the tremendous earthworks constructed slightly over two thousand years ago about the city of Ch'ang-an (meaning ' Long Peace ' ; possibly Ptolemy's ' Sera Metropolis '[2]), the capital of the then recently established Chinese empire.

It was in 221 B.C.—the year, it will be recalled, when the Carthaginian troops in Spain proclaimed Hannibal their commander-in-chief —that at the opposite end of the Old World the great conqueror Ch'in Shih Huang-ti[3] set up, on the ruins of a very ancient and separatist Chinese feudalism, a centralized and bureaucratic empire which in many details of its organization strikingly recalls the one established some three centuries earlier in western Asia by Darius the Great.

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[1] The following account contains material included in a report, now in course of preparation, dealing with the investigations conducted in China during the period 1923–1934 by the Freer Gallery of Art, Washington, D.C.

[2] On this identification see, *e.g.*, René Grousset : *Histoire de l'Extrême-Orient* (Paris, 1929), I, 242 and note 5.

[3] This name, or rather title, means literally ' First Emperor of the Ch'in (Dynasty) ' ; he is mentioned, in another connexion, in Antiquity, March 1937, XI, p. 27.

Shih Huang-ti's dynasty, the Ch'in[4] (or Ts'in, as the name is sometimes spelled in English) fell a very few years after his death. There ensued a brief period of civil war and general turmoil. Out of this there emerged as victor a low born but nevertheless very able adventurer who thereupon founded the Former or Western Han Dynasty (206 B.C.–A.D. 7).[5] This was the man usually known in later history as Han Kao-tzŭ (his posthumous title); he played a part comparable to that of Octavius not quite two centuries later in putting an end to a period of civil strife and setting up a stable government. He at first thought of fixing the capital of his newly won dominions a short distance south of the Yellow River, in what is today the province of Honan. Ultimately, however, he established his permanent official residence some two hundred miles farther to the west, in central Shensi province. The city which he thus founded soon became one of the greatest of its day, anywhere in the world. Ch'ang-an during the period of its prosperity may have been rivalled in population and perhaps in extent by certain cities of the Near East and of northern India; but Europe certainly had nothing as yet even remotely comparable to it.

Then as always, however, Chinese architecture was essentially one of wood and *terre pisé*. Hence the ancient capital of the Hans has left us, above ground at least, but few remains of itself. Of these the most notable are portions of its great rampart of solidly tamped earth, and what is said to have been the foundation-mound of the principal building in the imperial palace-enclosure—the celebrated Wei Yang Kung, of whose almost fabulous splendour and magnificence many tales are told.

The site of the ancient city lies four or five miles northwest of Hsi-an Fu (sometimes spelled 'Sianfu' in English), the capital of the province of Shensi, and a little south of the historic Wei, a western affluent of the Yellow River. The country hereabout is an intensively cultivated alluvial plain which rises into hills some distance to the south.

[4] From this word almost certainly came our name 'China'. Those who deny this (usually on the ground that the name 'China' ante dates the founding of the Ch'in *empire*) forget that the *state* of Ch'in was established several centuries earlier, and long before Shih Huang-ti's time had already annexed the eastern termini of both the great land-routes linking the Far East with the Occident, the one by way of Central Asia, the other through Farther India.

[5] The Han Dynasty, it should be remarked, was the first Chinese ruling house to spring from the ranks of the common people. The founders of all the earlier ones had belonged to the turbulent, hard-drinking, chariot-fighting feudal nobility, the possessors of the Chinese Bronze Age civilization (in regard to the latter point *cf.* ANTIQUITY, December 1933, VII, p. 404).

The morning was misty, the visibility poor ; but as we approached the site we began to see ahead of us a lofty and now shapeless mound, obviously artificial in origin. This stood, we found, at the south-eastern corner of the ancient city. Closer examination showed that it was composed of successive layers of *terre pisé*, rammed very hard and averaging about four inches in thickness.[6]

The present height of the mound we estimated at around fifty feet. That it had once been surmounted by a large building of some sort, presumably a wooden castle, was indicated by the occurrence, both on its sides and in the loose earth at its foot, of large gray unglazed roofing-tiles of the kind used in China during the Han period. Lying all about was much broken pottery, in part likewise of Han date. On top of the mound was a ruinous square beacon-tower of gray burnt brick ; this structure, of a type still to be seen all over northern China and formerly used in the transmission of smoke or fire signals, was probably not over three or four centuries old. From it we could see, stretching away to north and to west, the remains of the ancient city's great ramparts of earth. These, though in some places still quite well preserved, were for the most part much eroded, terraced for cultivation, and here and there almost completely dug away.[7] Their entire perimeter we could not attempt to trace, for want of time. Old Chinese maps suggest however that their circuit is somewhere around fifteen or sixteen miles ; they indicate too that the old city was roughly quadrangular in plan.

Part at least of the material composing these ramparts was pretty surely taken from what was now a dry moat or ditch which we saw just outside them. This we found, at the point where we measured it, 160 feet wide, with a present average depth, even though now much silted up, of nearly 10 feet. If it had ever served as a wet moat, the water to fill it must have come from a stream, shown on old Chinese maps but now no longer in evidence, which seems to have flowed into it near the southwestern corner of the city.

Immediately west of the great corner mound just mentioned, there was in the south wall of the ancient city a wide opening through which

[6] Recent excavations at the two opposite ends of the Asiatic continent have shown that the use of *terre pisé* construction dates back, in China at least to the second millennium B.C. and in the Near East considerably earlier still.

[7] Such accumulations of earth, on account of their high ammonia content, are much used by the northern Chinese peasantry as fertiliser. Analogous practices are found elsewhere, as for example in the *terremare* of north Italy and the *terpen* of west Friesland.

ascended (see *post*) the cart-road by which we had come out from Hsi-an Fu. This gap provided us with an excellent cross-section of the rampart as well as a convenient opportunity for measuring its profile.

It proved to have been constructed throughout of layers of *terre pisé* identical with those already mentioned, and was quite without anything in the way of a revetment. Closely similar in their method of construction, except that they are usually provided with outer and sometimes also inner facings of large gray burnt brick laid in lime plaster, are the walls of many existing Chinese cities (PLATES I, II). Occasionally, as for instance in the ' Red Basin ' country of the western province of Szechuan, where an easily worked red sandstone is readily procurable, these revetments are of dressed stone laid in regular courses of equal thickness, recalling the *opus isodomum* of Vitruvius. In general, however, the walls of Chinese cities have always been of earth, in later centuries generally, though not always, faced with brick. Significant of this is the fact that the ideograph for ' city-wall '[8] has as its determinative or ' radical ' the character for ' earth '. The original Great Wall of China, constructed a few years prior to the founding of Ch'ang-an and just at the time of the Second Punic War, was likewise of earth, as indeed are long portions of it still (*cf.* PLATE III).

The ancient rampart which we were studying rested directly upon the original surface of the soil, without the interposition of a stone plinth or a damp-course of any kind. Its thickness at the base we found to be 350 feet. Protruding from the western side of the aforementioned gap, near the top of the wall, were remains of what had evidently been a drainage-system of gray unglazed tile ; for the region, though in general comparatively dry, experiences torrential summer rains. At the foot of the rampart's outer face, still quite steep (owing to the durability of the *terre pisé*) even after the lapse of twenty centuries, we found traces of a narrow berm (see FIG. 1, drawing of cross-section of rampart), now almost worn away. It may originally have been 15 feet wide, possibly even less ; in any case barely enough, it seemed, to withstand the thrust of the vast mass of rammed earth above and behind it.

The vertical height of the outer face, above the berm, we found to average 25 feet in its present state. We noticed particularly that there were in the line of the wall none of those rectangular projections or salients, often loosely called ' bastions ', seen in many of the Chinese

[8] The same character, pronounced *ch'êng*, also means ' city ; ' for according to the traditional Chinese way of thinking, the wall is what makes the city.

city-walls built during more recent centuries (see PLATE IV). On the contrary, at Old Ch'ang-an we saw only the long straight curtain-wall, with no provision, save possibly at the city gates (see *post*), for the directing of a flank fire against bodies of assailants.

Extending back from the brink of the outer face of the rampart were the remains of a platform or parapet of *pisé*, once no doubt level but now much cut up by erosion and cultivation. This was 42 feet across at the widest of several points where we measured it; while in places its now very irregular inner edge rose as much as 10 feet above the terreplein behind it. The latter sloped gradually and on the whole evenly downward to the general level of the area inside the walls; there was no sudden change of profile to indicate where the terreplein had terminated and the inner face of the rampart had begun (*cf.* FIG. 1).

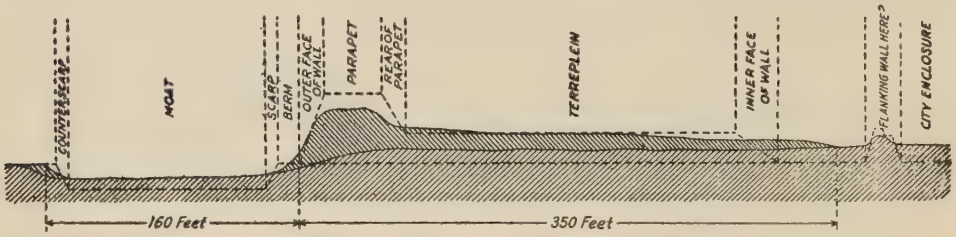
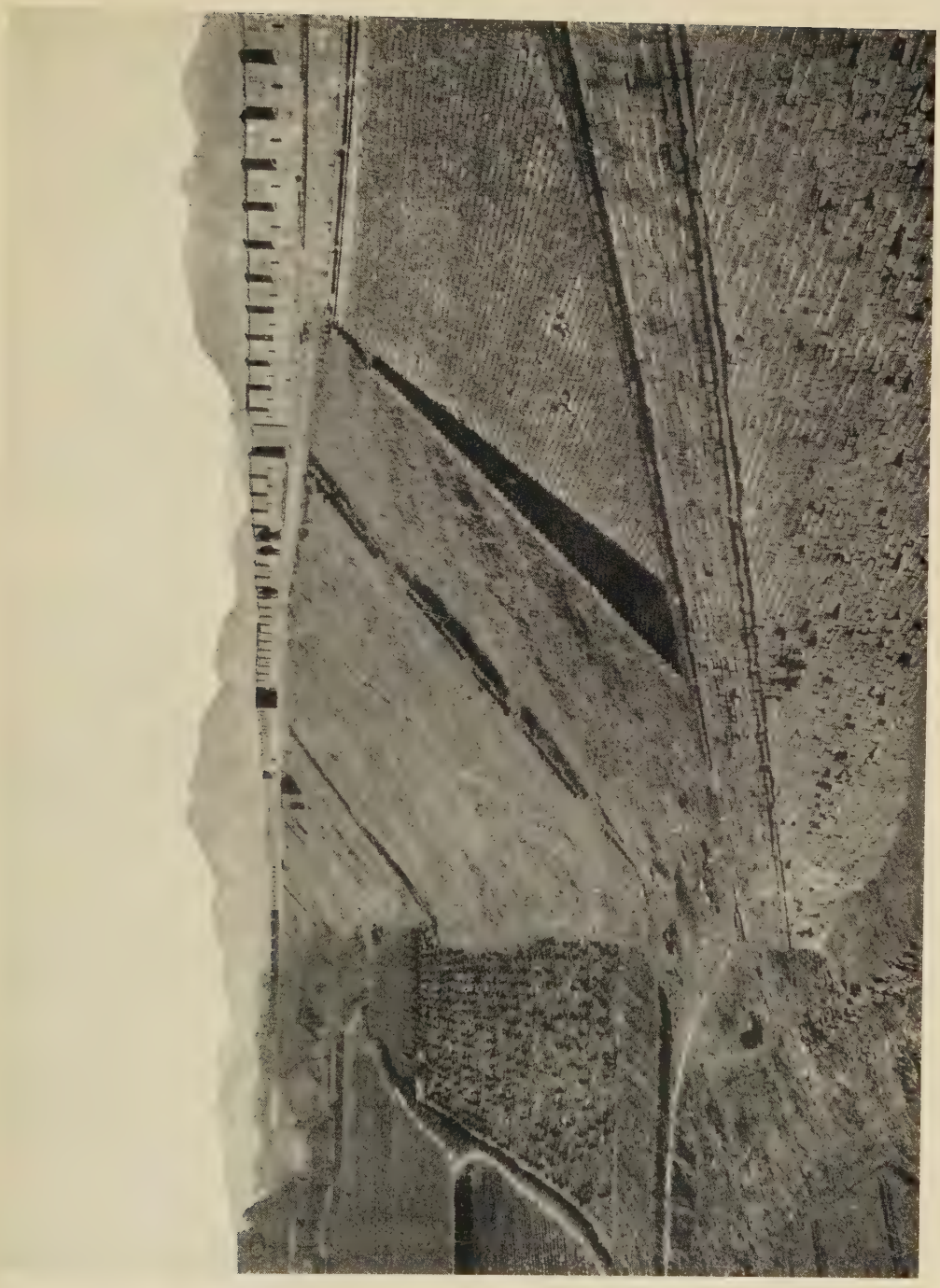


FIG. 1. DRAWING OF PROFILE OF RAMPART, OLD CH'ANG-AN; SUGGESTED RESTORATION IN BROKEN LINES

That this did not represent the original condition, however, appeared likely, for the following reasons.

We found, in the first place, that this long interior slope was for the most part covered with uncompacted earth, in places to a depth of 4 or 5 feet and obviously washed down from the parapet above. Secondly, at certain points beneath this layer were to be seen portions of what appeared to be a continuous stratum containing Han roofing-tiles, bricks, and potsherds and resting directly upon the tamped earth of the original *agger*. These facts suggested, first, that the top of the parapet had once been somewhat more than 10 feet higher (see *ante*) than the terreplein; and, second, that on the latter had once stood buildings, erected presumably on a level, not a sloping, surface. Thus we might reasonably suppose that the rampart as originally constructed had had, in addition to a parapet, a true terreplein and a distinct inner face—the latter doubtless much lower than the outer one and now completely masked by detritus washed down from above.

PLATE I

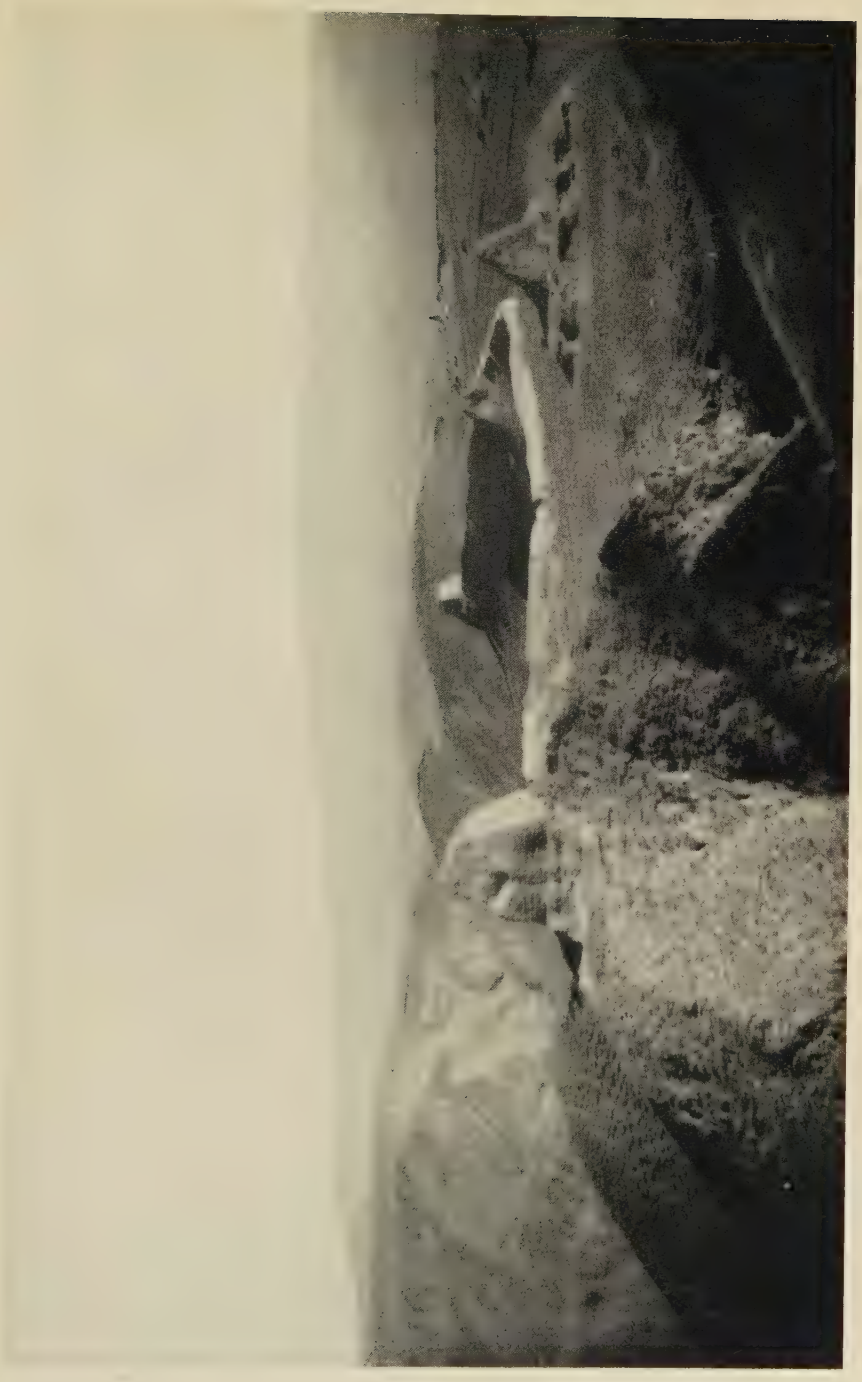


INNER FACE OF CORNER OF CHINESE CITY-WALL, WITH RAMP FOR ASCENT EXTERIOR FACED WITH BRICK (*see* p. 71)

facing p. 72

CROSS-SECTION OF CITY WALL OF PEKING, SHOWING CONSTRUCTION; FACED ON BOTH EXTERIOR AND INTERIOR WITH BRICK (*see* p. 71)

PLATE II



PORTION OF GREAT WALL OF CHINA, NORTHWEST OF PEKING, BUILT OF EARTH WITH EARTHEN TOWERS (*see* p. 71)

PORTION OF EASTERN WALL AND MOAT, PEKING; TO SHOW 'BASTIONS' CORNER TOWER IN DISTANCE (*see* pp. 71–2)

As already stated, the cart-road from Hsi-an Fu entered the ancient city enclosure through a wide gap at the eastern end of the southern wall. This opening, we felt certain for several reasons, indicated the spot where once had stood a city-gate. None of the old Chinese maps of Ch'ang-an appears to show a gate at this spot; nor does it seem very probable that one should have been placed there; for gates do not ordinarily occur at the corners of Chinese city-walls. Possibly the gap in question may have been cut through the rampart at some time subsequent to the original building of the wall.

Be that as it may, the track here mounted quite steeply and once inside the *enceinte* turned abruptly to the left or west. This change in direction brought it parallel to a low rise in the ground directly across the opening and a short distance inside or north of it. Whether this rise represented what had originally been an earthen wall forming part of the defences of the gate, we were unable to determine by inspection alone. But had there been such a wall, its effect would have been to compel an attacking force, once it had broken through the gate, to turn sharply to the left and thus expose its right or unshielded side to an enfilading fire from the defenders.[9]

For some 400 yards or so to the west of the above gap we found the gigantic *agger* displaying in general much the same profile and dimensions as those just described. Then came a second wide opening, where, we felt sure, there had formerly stood another gate. Flanking this on either side, on top of the rampart were the badly eroded stumps of two mounds. On these, it appeared likely, had once stood twin gate-towers, doubtless of wood; for in the earth about their bases we found embedded numbers of large roofing-tiles of the kind already mentioned. Such gate-towers seem sometimes at least to have been joined by a covered gallery of wood extending from side to side above the top of the gate proper.

The Chinese gate-tower of later centuries, as is well known, has been a single structure built *directly over* the opening in the city-wall, usually in two or three storeys, with the up-turned roof corners so familiar on Chinese buildings.[10] What appears to have been the older

[9] Shields formed part of the equipment of the Chinese warriors of the time, as shown, for example, on the famous Han 'reliefs' (in reality incised drawings on stone slabs) from the province of Shantung and by numerous passages in the surviving historical records.

[10] These upward-curving roof corners were a post-Han development in Chinese architecture. Until long after the beginning of the Christian era, Chinese roofs had straight lines.

type, with twin towers *flanking* the gateway, is still however to be seen in a few provincial towns.

A road passed through this second gap also. Upon entering the city it turned, like the other, at a right angle towards the west. Here too this abrupt change in direction seemed to have been determined by a transverse rise in the ground just inside the opening.

Extending from this second gap directly across the moat to the counterscarp, we found what seemed once to have been a causeway, now much broken down. This, as far as we could tell, had not been constructed of *terre pisé*, but had been merely a strip of the original soil, left untouched when the moat was dug ; it thus recalled in a way the ' interrupted ditches ' found at certain prehistoric sites in the Occident. Over its remains passed the road mentioned in the preceding paragraph. We had noticed nothing suggesting the former existence of a similar causeway at the first gap—perhaps an additional indication that the opening there was made at some later period.

From this point we traced the rampart for some distance farther to the west, and found it growing more and more eroded and worn away, until at length it practically disappeared save for a few uncertain remains. Others, apparently better preserved, we could see far away across the river-plain ; but these we had not the time to visit.

Before we leave our discussion of these earthworks, it will perhaps be of interest to touch briefly on the probable reason for their enormous and seemingly unnecessary thickness. For the tremendous additional labour and expense thus incurred can only have been undertaken for the sake of providing against some very real and compelling danger.

During the middle of the first millennium B.C. the arts of war and notably of siege-craft made great progress in China. Particularly was this true in regard to the use of mines. These were employed, then as later, for two purposes ; the one, to gain direct access to the interiors of beleaguered towns, the other, to overthrow their ramparts and thus effect a practicable breach for a storming party. The latter aim the Chinese military engineers of that day did not achieve with the aid of explosives, then still unknown in China as elsewhere. Instead, they tunnelled beneath the earthen city-walls and there excavated a large chamber whose ceiling they supported by means of stout timbering ; this they then set on fire, thus causing it to give way and allow the section of rampart immediately above it to drop into the cavity.

The earliest mention in Chinese literature of this proceeding, so far as I know, dates back to around the beginning of the fourth century

B.C.[11] and the passage would imply that it had already then been known in China for some time, perhaps even as much as a century or two, although scarcely more than that. For prior to around the middle of the first millennium B.C. the methods employed by the Chinese in the capture of walled towns had been chiefly those of surprise, escalade, or blockade. As in the Occident (*e.g.* at Croton in 510 B.C. and at Mantinea in 385 B.C.), so in China also, rivers were sometimes diverted against city-walls and made to undermine them. It seems to have been slightly later (*i.e.*, after the middle of the same millennium) that in both China and the West there came into use the above-described method of breaching walls by mining. It was employed in the latter region, for instance, at the siege of Megalopolis by Polyperchon[12] in 318 B.C. and at that of Abydos by Philip V of Macedon in 200 B.C.

It is only fair to say, however, that the best military opinion in ancient China, such as that of Sun Tzŭ,[13] was in general opposed to the investment of fortified places, preferring rather to bring about their surrender by overcoming the enemy's forces in the field.

In any event, against a rampart so massive and a moat so wide and deep as those which we saw at Old Ch'ang-an, even the most effective methods of siege-craft known to the ancient Chinese must have been well-nigh powerless. The capital of the Hans, though seated in a wide plain and so owing nothing of its strength to natural position, must have been as nearly impregnable to direct assault as was ancient Babylon.

The space inside the ramparts was, we found, a slightly undulating plain dotted with the mud hamlets of the local peasantry and with clusters of small modern grave-mounds shaded by trees ; but for by far the greater part under intensive cultivation. As we might expect in a city occupied for so long a period (in all about two hundred years) as was Old Ch'ang-an, the present surface of the site, within the walls, was on the whole distinctly higher by several feet than was the surrounding country. Accumulations of downwash from the inner slopes of the earthen walls have no doubt been responsible for some of this rise in level ; but much—probably most—of it was certainly the direct result of long continued human occupation. Similarly the level of the area inside the walls of Peking, inhabited continuously for a period

[11] *Mo-tzŭ*, chap. XIV, par. 62.

[12] Formerly miscalled ' Polysperchon '.

[13] Also called Sun Wu ; *fl.* 4th century B.C. On his writings see Lionel Giles : *Sun Tzŭ on the Art of War*, London, 1910 (trans. from the Chinese, with notes).

roughly three times as long as was Old Ch'ang-an, is today in many places from 20 to 30 feet higher than it was originally.

Immediately west of the city proper and separated from it by the much eroded remains of two parallel earthen walls of no great size which ran north and south about a hundred feet apart, we came upon the old palace-enclosure of the Han emperors. The surface here also was somewhat undulating in character. Some of the slight irregularities in level made us wonder whether they might not conceal the remains of ancient buildings ; for the records speak of a number of palaces. The

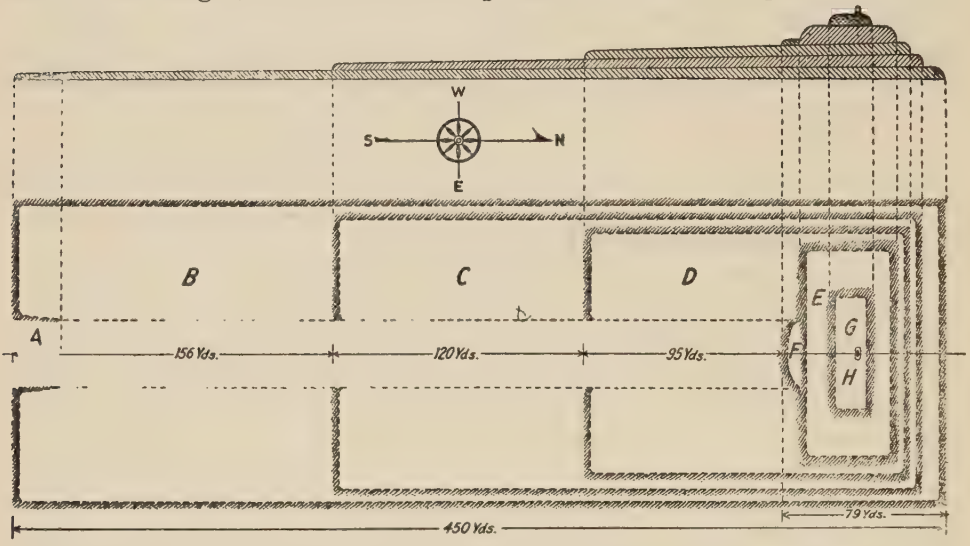


FIG. 2. PLAN AND ELEVATION OF WEI YANG KUNG PALACE FOUNDATION-MOUND, OLD CH'ANG-AN

ground here, however, just as in the city proper, had been so long and so continuously under the plough that all surface indications had disappeared, except at one point.

Here, some hundreds of yards ahead of us, a little to the south of west, we saw a long mound in several superimposed stages, with its major axis extending due north and south and perhaps coinciding with that of the palace-city itself. This mound, our Chinese companions told us, had been the foundation-platform of the principal edifice in the old palace complex, the celebrated Wei Yang Kung already mentioned (for its plan and elevation see FIG. 2).

We found the ground-plan of this interesting construction that of

a long rectangle, with corners surprisingly well-defined considering its age. The total length was 450 yards, its breadth 145 yards, and it was built in five stages, of which the highest, near the northern end, rose some 50 feet above the surrounding fields. It had been constructed of successive layers of *terre pisé* like those forming the rampart that we had just been examining, and was now thinly covered with grass save for patches of cultivation here and there, and for a few great stones of which we shall speak in a moment.

Exactly at the centre of the southern end of the rectangle we found traces of an approach or gradual ascent of some kind, apparently a ramp (marked A on the accompanying plan, FIG. 2), about 100 feet in width east by west. It extended north, sloping gently upward the while, for some 70 feet, to the level of the top of the lowest terrace (B on the plan). The surface of the latter, aside from the ramp, was practically level and extended for 156 yards until it came to the second stage (C), marked by a sharp rise or step of 2 feet. From this point north, a slight upwards slope brought us to another abrupt rise of 2 feet marking the beginning of the third terrace (D). The ground thence continued rising gently until, 95 yards still farther north, it reached the edge of the fourth stage (E). This was a steep earthen bank some 10 feet high ; from its southern face there projected a somewhat lower platform of earth (F), now much eroded but apparently once rectangular in form ; its ends were in exact alignment with the borders of the (unpaved) avenue of approach, which we had been able to trace, intermittently, up to this point.

The mound culminated in a long narrow terrace (G) about 12 yards wide north and south and extending east by west for some 65 yards ; its fairly level top stood about 6 feet higher than the preceding stage. Here, at the apex of the mound, was a commemorative stela encased in brickwork (H), erected in the year 1695 at the behest of the great Manchu emperor commonly called by Europeans K'ang-hsi.

The rearward or northern end of the mound descended to the level of the fields about it in a series of unequal and now much eroded stages—the borders of the successive terraces just described. These however projected far less beyond one another here than they did on the south ; the total distance from the centre of the uppermost stage to the northern edge of the lowest amounted only to some 50 yards, as against about 400 yards in the opposite direction.

Scattered here and there over the surface of the great rectangle were several large water-worn boulders, already mentioned (these I

have not indicated on the plan (FIG. 2), as we were too straitened for time to determine their positions even approximately). These were not grouped or arranged in any regular order. They rested directly on the tamped earth of the mound at varying heights above ground-level, and could only have reached their present position through human agency. According to the surmise of our Chinese companions, they may have been ornaments in some garden or pleasance within the ancient palace. It seemed clear at all events that they had not fulfilled any structural purpose.

The Wei Yang Kung mound as we saw it, even in its present state of nakedness and desolation, possessed a certain aspect of dignity and proportion and balance. Rising out of a level plain, and covered as it was during Han times by stately buildings (probably with painted or lacquered columns and brightly coloured roofs of tile),[14] it must have presented a most inspiring spectacle to all who beheld it—to the native subjects of the Son of Heaven themselves as well as to the visitors from many lands, some of them in the distant West, who we know thronged the capital city of the Hans.

In China the walls of cities have retained their usefulness as in perhaps no other country. An instance of this occurred a few years ago, during a civil war. The attacking force attempted to use poison gas ; whereupon their opponents retired inside a walled town, closed its gates, and found themselves quite safe. City walls have been placed in repair (although probably not constructed *de novo*) in China in very recent times. The study of their development there through so long a period is therefore particularly instructive.

The earthworks at Old Ch'ang-an, dating as they do from an epoch when China's Bronze Age had only comparatively recently become one of Iron, are especially worthy of study. During the few hours that we were able to spend there, we saw enough to convince us that systematic and extended excavation would beyond doubt yield results of very great interest. Moreover the nature of the site was such as to lend itself particularly well to survey by aeroplane. Vertical air-photographs of its varied features would be of especial value and would be almost certain to reveal details which had escaped our notice on the ground.

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[14] Roofing-tiles of baked clay seem to have come into use in China during the Eastern Chou period (770–255 B.C.). By Han times, from around 200 B.C. onward, those used to cover important buildings had begun to be painted in bright hues. It was not until the epoch of the Six Dynasties, well after the commencement of our era, that the practice arose of covering them with coloured glazes.

Notes and News

TIN-DEPOSITS IN THE NEAR EAST

Tin is of interest to archaeologists because, alloyed with copper (the earliest known metal) it forms bronze, the material normally used for implements and weapons before the discovery of iron. Natural deposits of tin are rare ; not more than about half a dozen regions must have supplied the whole of the ancient world. The use of bronze in any region where tin does not occur naturally implies traffic with such a region.

The time and place where metal was discovered and first used is still uncertain ; but it was probably somewhere in the mountain region to the north or northeast of Mesopotamia. The earliest known metal objects were of copper ; but bronze makes its appearance at an early date. Nothing certain is known of the source from which these early metallurgists obtained their tin. The nearest well authenticated natural deposits are situated 2000 miles and more to the west ; and it is most unlikely that these were the first to be worked. On the other hand there are persistent statements that tin occurs naturally in the mountainous hinterland of Mesopotamia, where copper deposits are also found and where the alloy and its superiority (in hardness) to pure copper might well have been discovered accidentally. Many years ago, before the war, I collected some notes on this subject, with the intention (never carried out) of writing it up some day. That is not possible without access to a good library and map-collection, and since then neither the opportunity nor the necessary leisure have been available. It seems desirable however that the references should be published, so that others may perhaps follow them up. In so doing I apologize for their incompleteness and the fact that there are no references to anything published since about 1910 when they were first amassed. At the time the books referred to were all consulted, but it is possible that some of the clues are false. When all is said and done, however, there does seem to be a very strong probability that natural tin-deposits, probably the earliest ones known, occur in the mountains of Armenia, Kurdistan or Iran.

The fullest and most circumstantial account concerns the alleged tin-deposits of Khorassan. It consists of a posthumous note by von Baer published in *Archiv für Anthropologie*, vol. IX, and quoted in

Matèriaux, XII, 138–9, from which the passage below has been translated. The information was obtained by von Baer from a friend of Monsieur de Semenov, the Vice-President of the (Russian ?) Geographical Society, whose name was Ogorodnikow. He says: 'Aga Kasym Ragiin, an inhabitant of the town of Meshed (lat. 36° 15′N, long. 59° 35′E) and lessee of several copper-mines in Khorassan, told me that at a distance of 1.20 farsangs (7 versts) from the town of Utschan-Mion-Abos occur the richest mines of tin, iron, copper, sulphur and lead; and that at 2.6 farsangs from Meshed is a tin-mine called Rabodje Alokaband. The accuracy of this information was confirmed by Hadschi Ibrahim of Bokhara, who knows the region, and a large number of people who work in the mines. Moreover, the fact that tin is a product of the region is proved by the abundance of large vessels (brocs) and plates of this metal which are found in all the houses and which are regarded as very old and manufactured from local tin. On the other hand, merchants having commercial relations with Merv know that the mountainous districts of Turkmenistan (Turthmenie, *sic*), inhabited by the tribe of Teke, abound in minerals, amongst which tin is mentioned'.

It seems difficult to believe that there is not something behind this very circumstantial account. Since it was published, however, it has been neither confirmed nor supplemented by any subsequent traveller. A letter addressed by the present writer to the British Legation in Tehran, which was followed by local enquiries, produced merely negative results.[1]

The following other references to Tin may be added :—

ANGERT.

A deposit of tin associated with iron pyrites and copper at Angert, east of Alikhan Dagh. Petermanns *Mitteilungen*, 1904, 235; R. Wilbraham, *Travels in the Transcaucasian provinces*, 1838, 71; C. C. A. Grewingk, *Geogn. und Orogr. Verh. des N. Persien*, 1853, 68. *Vendidad-Sade*: book of Zoroaster (quoted by Lenormant in *Arch. Préh.* 1873 [?], 131).

TILLEK.

'In the vicinity [of Tillek and Surp Carabet] there are some very rich copper and tin mines, and immediately above a large rock composed of loose pieces of an intensely black stone heavier than lead, but shining

[1] I take this opportunity of thanking the British Legation authorities for their kindness in investigating this matter.

like marble, which further on is streaked with delicate white veins'. J. G. Taylor's, *Journal of a Tour in Armenia, Kurdistan and Upper Mesopotamia*, with notes of researches in the Deyrsim Dagh in 1866; *Journal of the Royal Geogr. Society* (London), 1868, XXXVIII, 339.

ASTERABAD.

L. de Launay (*Les richesses minerales de l'Asie*, Paris, 1911) states that auriferous sand was washed out at Damghan on the Kouh-i-zar and that 'the same district of Asterabad appears to contain a little tin' (p. 661).[2] See also an article in *Rev. Arch.* 1882 on 'L'Orfèvrerie d'étain dans l'antiquité', describing some of the eastern sources of tin.

DRANGIANA.

Strabo (Ch. 724, Teubner edition, 1877, pp. 1009–10) says that the Drangai had tin (*γίνεται δὲ παρ' αὐτοῖς κασσίτερος*).

The presence of copper-deposits associated with those of tin in some of these places is of the first importance if the facts can only be authenticated. Perhaps some of our readers can help. A trip to Meshed would probably settle the matter once and for all, and provide an interesting motive for an unconventional holiday. O.G.S.C.

THE KISH GOAT, BULGARIA (PLATE I)

As I was motoring southwards from Sofia to the village of Zlokutchene in Bulgaria last September with a party of archaeological friends, I observed not far north of the village a herd of goats being pastured by the wayside. It was obvious that some of them had the crumpled horn characteristic of the Kish goat described by Professor Amschler in a recent number of ANTIQUITY (1937, XI, 226, plate V). It will be remembered that this is the same animal as the 'ram caught in a thicket' whose effigy, found in the grave of Queen Shub-Ad at Ur by Sir Leonard Woolley, is now exhibited in the British Museum; and that the horn of one was found at Kish by Mr Henry Field of the Field Museum, Chicago. I took some photographs and subsequently forwarded them to Mr Field, who sent them on to Professor Amschler. In his letter to me Professor Amschler confirms the identification, adding that the Bulgarian herd has probably been crossed with the old form (*Capra prisca*). 'The Mesopotamian type can be very well recognized on PLATE I. Here it is the goat on the left, whose head and horns are just visible, which corresponds exactly to that of *Capra*

[2] He also mentions on the same page the presence of auriferous quartz at Tarkobeh, west of Meshed, and of worked-out copper-mines at Fahr-Daud, near Boymichk.

girgentana. Since the publication of my note I have studied the distribution of this very interesting goat-type, and have discovered that, outside Sicily, it is found in the islands of Crete and Malta, in Greece and southern Albania, and also, as you have now proved, in Bulgaria. I congratulate you on this extremely interesting observation '.

It is obviously too early to speculate upon the archaeological implications of this distribution, which may be expanded by future observations. I would merely suggest that readers of ANTIQUITY who travel on their holidays might keep a look out for goats with crumpled horns, and photograph them. Needless to say I shall be glad to forward any such photographs to Professor Amschler ; and may I add that, for purposes of identification, *enlarged* prints (not contacts) are most desirable ?

We are merely at the threshold of the fascinating new subject of ' animal ethnology ', which may eventually throw as much light upon the diffusion of culture as does the study of human antiquity. The starting-point is, of course, the preservation and specialist description of animal bones obtained by excavation from ancient sites. Nowadays this is a normal procedure on all properly conducted expeditions. Such work provides the zoologist with essential facts for the study of the evolution of breeds and species. O.G.S.C.

PREHISTORIC ORGANIC REMAINS*

The time has come to abandon the notion, still widely held, that all organic matter decomposes into refuse and ash immediately it is buried underground, since investigations in many places have already succeeded in revealing quite considerable prehistoric organic remains in the soil ; besides charcoal, such materials have been found as fabrics, leather, resins, and recently food remains and even whole plants. Heer broke the spell by his classical researches in the pile-dwelling village at Robenhausen. Since then many later investigators, such as Netolitzky of Cernauti, Newueiler of Zurich, E. Hofmann of Vienna, and Bertsch of Ravensburg amongst others, following in Heer's footsteps, have supplied numerous important contributions to the solution of the problem, particularly with regard to the prehistoric flora of the Alpine lake dwellings. It is true that the soil conditions in the marshy ground of these silted-up and silting-up Alpine lakes, as also the peat bogs of northern Middle Europe, are exceedingly favourable to the preservation

* Translated by J. F. S. Stone.

of organic remains. Because this was known, indeed was held as an ideal state, it persisted for a long time until other soils had been investigated. The first attempt was not very encouraging. Not until one began to study systematically the decomposition phenomena of organic fragments was a successful advance possible.

These investigations on soil chemistry yielded first of all the surprising fact that the marshes in which the occupation layers lie are subject to conditions entirely different from those of the bogs of the north German lowlands, Jutland, and Scandinavia. In the Alpine lakes and in their silted-up zones both the water and the soil are alkaline on account of the lake chalk present, whereas in the north the bogs are acid almost throughout. This observation leads at once to the rejection of an old and well worn opinion. One is still able to read in almost the whole pertinent literature that the Neolithic and Bronze Age inhabitants of the pile-dwellings were acquainted with linen only, from which they made their clothing and fashioned their nets ; in contrast thereto that the northerners had wool only at their disposal and, therefore, that woollen garments only were worn, which have certainly been preserved for us in unusual magnificence in Bronze Age wooden coffins. In reality, however, wool is soluble in alkalies and must dissolve therefore in the chalk and in the moisture lying over it, whereas linen remains preserved if shut off from oxygen and bacteria. It is otherwise in the north. There the imbedding material is acid, and is in fact bactericidal in the greater depths of the bogs. Wool must therefore at all events remain preserved ; but flax, and cellulose in general, disappears if the acid has not attained a strength harmful to bacteria. In investigations in progress in the north linen has indeed been looked for and has actually been found.

Accordingly, within the compass of these inquiries, it appears to be established that the statement to be found in almost every book that the preservation of the northern wooden coffins of the Bronze Age may be traced to the action of the tannic acid in the oak trunks used, is absurd. Of the innumerable wooden coffins, whose presence has become known to us through excavations, only those remain preserved which have lain in soil bounded by stones, so that the water in the barrows cannot drain away but is obliged to stagnate and thereby become acid.

In order to pursue the investigations it was necessary to establish the chemistry of the acids present in the northern bogs. This indeed presented great difficulty. The result was that it was found to be a question of the *humic acids ;* and not of a single chemical compound,

but of whole groups which did not even react uniformly. The investigations are as yet far from complete. At this point geology and the chemistry of prehistoric remains meet and work is being carried on from both sides towards a solution of the problem. At the present day the following appears to be clear: the humic acids are auto-oxidizable and pass over automatically into the more highly oxidized state up to the point where they have transformed the substrate, which they have attacked, into carbon with the retention of the original form of the latter. An example from prehistory may be used to illustrate this: the prehistoric farmer kept his cereals underground, which is clearly an unsuitable place for such materials because in this position they certainly meet conditions suitable for germination. If it did not germinate it must have become musty under the influence of bacteria. The prehistoric farmer protected himself from both of these harmful natural processes by roasting the cereals before storage, which means that he put around each grain a layer of humic acid. This layer, which was only weakly attached to the grain some thousands of years ago, eats its way in further in the course of time and would undergo oxidation; when we find the cereal today it is mostly by this time carbon in the form of cereal grains.

Now highly oxidized humic acids have the one advantage that they dissolve in alkalies. This we turn to useful purpose, and in fact, if an organic find from the plant world has not yet reached these higher states of humic acid, we oxidize it further in a bath of nitric acid and potassium chlorate. The results are always so good that a microscopic examination of the residue is not impeded, and is often even so favourable that after washing away the colloidally dissolved humins in alkali it is still possible to conduct colour reactions as with recent material.

Only in the highest stages of oxidation, that is to say with carbonized cellulose and with lignin, is potash no longer usable; precisely since all has been converted into humic acid. After great trouble a successful method of attack has now been found. We imbed the object to be examined in a mixture of Gum Damar and Canada Balsam, cast it in Plaster of Paris, and cut a section from it by grinding. The ground surface is thereupon photographed under the microscope, using infra-red plates, with surprising results.

In the discussion of the humic acids in prehistoric cereal grains a further important advance in the chemistry of prehistoric substances is really indicated. It has been possible in fact to identify the acid, found originally in the northern bogs, in *all* soils of an acid character. We

are so far advanced today that *no* prehistoric potsherd that has been found in a soil possessing a Ph value below 6 is brought immediately to the laboratory for cleaning. It is rather first examined carefully for food remains by means of a magnifying glass.

Naturally conditions for preservation are never so favourable in ordinary soils as in bogs, and it is only with the help of microchemistry and the microscope, with infra-red plates and luminescence analysis in filtered ultra-violet light, that it is still possible to make the organic objects, in so far as they are of plant origin, yield the required information.

It is more difficult to trace organic remains of animal origin. For this purpose the excavator must send in not only the contents of the pot itself, but also samples of earth from the culture layer and from the corresponding soil layer. In the laboratory a so-called blank test is then made on both of the last, which means that the soil samples are examined in the most accurate quantitative manner for iron, phosphate, nitrite, nitrate, ammonia, calcium, and amino-acids. Only then does the sample of the contents of the pot undergo similar treatment. From the various values so obtained conclusions may be drawn. Nevertheless these would often be very vague were it not that acid soil (so long as it is not pure sand) possesses the property of absorbing all fats, of plant as well as of animal origin. It is true that it is no longer the fat that it was during the prehistoric period. The alcohols have long ago disappeared and only the fatty acids remain preserved. These are removed from the earth by means of alkali, the filtrate acidified with sulphuric acid in a separating funnel, and extracted with petroleum ether. If the yield is large enough we esterify the acids by the Täufel method and after this process fractionally distil them. If this is not possible cholesterol or phytosterol is crystallized out in order to obtain a clue as to whether it was an animal or a vegetable fat. In addition the molecular weight of the fatty acid mixture so obtained—for only as such can it be treated—is estimated by titration with decinormal alkali ; and the micro-melting point determined by the method of Kofler. Also the remaining constants, saponification number, ester number, and iodine number are recorded, although at the present time not much has yet been attempted with these three values. In connexion with the Ph value of the soils these constants will, however, at some future date yield important indications, although that is a question which only time and numerous investigations can settle. That the iodine number is often surprisingly small need not surprise us. It is self-evident that

all unsaturated acids will long ago have split at the double bonds and become hydroxy-acids. The iodine number of a specimen, definitely shown to be linseed oil of the Viking period, yielded for instance a value of 74 as against the normal figure of 185 to 220.

Scientific prehistoric research is still young, but it presses on step by step so that, especially in Germany, there is scarcely a major excavation undertaken in which the microscope and the test tube do not stand in the same degree of importance as the spade, and have brought to light results which a few years ago would have been deemed impossible.

WALTER VON STOKAR.

CHINESE SOCKETED CELTS (PLATE II)

In ANTIQUITY for March 1937, discussing the period at which the socketed celt entered China, I suggested that the date was the sixth or seventh century B.C. It is the purpose of this note to point out that the actual date was several hundred years earlier, *i.e.* in the 12th or 11th century B.C., at that period of bronze decoration to which Professor Yetts has applied the term ' First Phase '. In other words, there is now evidence that the socketed celt existed in China towards the end of the Shang-Yin dynasty.[1] I am indebted to a number of colleagues for drawing my attention to this fact, particularly to Mr O. Karlbeck and Dr F. Bergman of Stockholm and to Bishop White of Toronto.

Some years ago, when in China, Mr Karlbeck obtained for me the massive, rather coarsely ornamented socketed celt shown in PLATE II. I tended to look upon this as a clumsy archaism, and it was only when I heard from Mr Karlbeck that he had no doubt that it came from An Yang, the royal burgh of the later part of the Shang-Yin dynasty, while Bishop White independently expressed the same opinion on its appearance, that I began to realize its value as evidence. Any doubts that I may have had with regard to the age were dissipated by the raised pattern on the celt, consisting of three elements or characters : (1) a tortoise ; (2) an upright with a basket-like head, such a basket as is made by splitting the top of a pole into four, forcing the split ends apart, and keeping them in position by bark or fibre passed round them ; (3) a snake, depicted S-wise across the upright. These three elements, combined in slightly different manners, occur on a number of bronzes belonging to Professor Yetts' ' First Phase ' of bronze decoration, which

[1] The date of the Shang-Yin dynasty, traditionally 1765–1123 B.C., is uncertain; another system of dating gives 1558–1051 B.C.

ended in the 10th century B.C. Some variants of this combination are shown in the plate, and I take this opportunity of thanking my friend, Mr Arthur Waley, for his help in discovering examples as well as for assistance with regard to the meaning of the characters.

The first example found by Mr Waley is on each of three goblets (*chio*) decorated in First Phase style, reproduced by Liu T'i-chih in his big collection of rubbings recently published. His next discovery was in the *Yeh-chung P'ien-yü*, an album of photographs of objects found at An Yang with a preface dated 1934. In this is reproduced (vol. I, fol. 10 and 11) a tripod (*ting*) of the First Phase, bearing the triple sign reproduced on PLATE II. It is more remarkable that this publication reproduces a celt (vol. II, fol. 11) obviously cast from the same mould as that in my possession, and that careful comparison of the distribution of the patina compelled Mr Waley and myself to recognize that the celt figured in the Chinese publication and my example were one and the same specimen. I had previously recognized the triple sign cast on the bottom of a sacrificial vessel (*kuei*) of my own, said to come from An Yang, and Mr Karlbeck has figured the same sign on the upper part of a bronze beaker (*ku*) from An Yang now in the Museum of Far Eastern Antiquities, Stockholm.[2]

The triple sign thus occurs on a number of bronzes of An Yang provenance and does not appear to be known on bronzes from sites of other date. There cannot, I think, be any doubt as to the Shang-Yin origin of the specimen here illustrated, the remaining matter of interest being the significance of the triple sign. Mr Waley informs me that Liu T'i-chih's interpretation is ' younger brother Kuei ' (' Tortoise '), *i.e.* the name of an ancestor of a ' cadet ' branch. This rendering neglects the ' basket ' element, which is so obviously part of the pictogram, but in the present stage of our knowledge it does not seem possible to go further without being unduly speculative. I will only add that Professor Yetts informs me that other instances are known of weapons and tools being inscribed in the same form as ritual vessels. Actually these from the archaeological standpoint are side issues, the importance of the specimen cited being that it appears to prove the existence of the socketed celt in China in Shang-Yin times.

C. G. SELIGMAN.

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[2] ' Notes on the Archaeology of China ', in *Bulletin No. 2 of the Museum of Far Eastern Antiquities*, (Stockholm, 1930) pl. II.

CAP-BLANC ROCK SHELTER[1] (PLATE III)

Through the kindness of the Abbé Breuil three photographs, formerly in the collection of the late Dr Louis Capitan, have been presented to Field Museum. These photographs were taken in 1911 at Cap-Blanc in the Dordogne district of France on the day of the discovery of the important Magdalenian skeleton, which has a prominent position in the Magdalenian section of the Hall of the Stone Age of the Old World in Field Museum of Natural History, Chicago.

Following the careful excavation of the skeleton, it was sent to Professor Marcellin Boule in Paris. In 1916 M. Grimaud, having made no money out of the discoveries on his property, decided to reclaim his anticipated profit, and during the stress of war conditions was able to ship the skeleton to New York, where he demanded a fabulous sum for it.

Ten years later Field Museum had word that the original Cap-Blanc skeleton was still in New York and had not yet been purchased from M. Grimaud. An offer by the Director of Field Museum was accepted and shortly afterward the Magdalenian skeleton was shipped to Chicago.[2]

During 1932 the skeleton was withdrawn from exhibition in order that the skull might be restored by T. Ito under the direction of Dr Gerhardt von Bonin (of the Department of Anatomy at the University of Illinois in Chicago) who was invited to prepare a report[3] on the skeleton, extracts from which follow :—

> When the skeleton arrived at the Museum, it was in an almost perfectly clean condition, only a few bones being still embedded in a matrix of somewhat gritty, loam-like matter. The long bones were almost all perfectly preserved. The pelvic and the shoulder girdle were somewhat damaged, particularly in the pubic region and the scapula.
>
> The vertebral column appeared to be complete, the vertebrae were for the most part still held together by adhering soil. Twelve left and ten right ribs were found, and a rather decayed square

[1] See J. Lalanne and H. Breuil, 'L'abri sculpté de Cap-Blanc à Laussel (Dordogne)'. *L'Anthropologie*, XXII, p. 385.

[2] Henry Field, *The Early History of Man with special reference to the Cap-Blanc skeleton.* Field Mus. Nat. Hist. Anthr. leaflet no. 26, Chicago, 1927.

[3] Gerhardt von Bonin. 'The Magdalenian Skeleton from Cap-Blanc in Field Museum of Natural History'. Illinois Medical and Dental Monographs, vol. 1, no. 1, University of Illinois, Urbana, 1935.

GOATS NEAR SOFIA, BULGARIA (*see* p. 81)
ph. O. G. S. Crawford

PLATE II

FRONT AND SIDE VIEW OF SOCKETED CELT, BEARING TORTOISE, SNAKE AND BASKET SIGN ($\frac{1}{1}$)

DIAGRAMMATIC RENDERING OF TRIPLE SIGN ON *KUEI*, SAID TO COME FROM AN YANG

RUBBING OF TRIPLE SIGN ON BRONZE TRIPOD (YEH-CHUNG P'IEN-YÜ)

(*see* p. 86)

PLATE III

CAP-BLANC SHELTER WITH MAGDALENIAN SKELETON ON LEFT (*see* p. 88). (M. Grimaud in foreground)
Ph. L. Capitan

piece of bone, apparently all that was left from the manubrium sterni. The cervical column was firmly attached to the lower jaw and a part of the upper jaw. The skull was broken into a number of fragments. The bones are of a brownish color, darker in some spots and lighter in others. They are firm enough to be handled conveniently, yet somewhat brittle. In some spots, dental cement had been put on the bones in order to prevent them from crumbling. This has obscured but few morphological details.

The general conclusions are that the Cap-Blanc skeleton belonged to a young woman about 156 cm. in stature and approximately twenty years of age.

In the exhibition case adjoining that of the skeleton is a life-size diorama of the Cap-Blanc rock shelter,[4] a reproduction modelled by Frederick Blaschke.

The Cap-Blanc girl, the only complete European palaeolithic skeleton on exhibition in a museum on the American continent, has attracted the attention of several million visitors during the past decade.

HENRY FIELD.

THE GREAT THEATRE, BYZANTIUM* (PLAN, p. 91)

The topographical works available to the student of Constantinople deal mainly with Byzantine architectural remains, and the older Greco-Roman foundations of the city have been almost entirely neglected. But when studying the topography of the city one is forced to consider the pre-Byzantine period. References to temples, theatres and palaces of the pre-Constantinian period can be found in many works, and with further research it should be possible to locate the position of these buildings. Without excavation it is almost impossible to decide upon the position of the temples, as those which stood upon more or less level ground are buried deep beneath accumulations of rubbish, or are built over. The location of the Greek Theatre is simplified by the fact that such buildings were almost always constructed on a steep slope on which the tiers of seats were built. The first question therefore is, can the theatre be located by the help of literary sources ?

[4] For more detailed description and photographs see: Henry Field, *Prehistoric Man.* Anthr. Leaflet no. 31, 3rd edition, Field Mus. Nat. Hist., Chicago, 1937.

* Translated by Mr I. Bell.

1. DESCRIPTIO XIV REGIONUM[1]

> Prima Regio, longa situm, plana in angustum, a Palatii inferiori parte contra Theatrum majus euntibus, dextro latere declivis in mare descendit.

This quotation indicates that the Great Theatre lies on the boundaries of the first region. The road to the theatre is described as running along a narrowing plateau which falls away sharply to the sea on the right. As the theatre is not included by the writer in his description of existing buildings,[2] it must be assumed that at that date it was only a ruin. To traverse the whole length of the Acropolis Hill, one must approach it from the southwest and walk towards the northeast. Then the steep declivity to the sea lies on one's right, and, according to the text, the theatre would lie before one.

2. CHRONICON PASCHALE[3]

> Καὶ (Σεβῆρος) ἔκτισεν ἀντ' αὐτοῦ ἐν τῇ ἀκροπόλει τῆς αὐτῆς Βύζου πόλεως ναὸν ἤτοι ἱερὸν Ἀπόλλωνος . . . κτίσας ὁ αὐτὸς βασιλεὺς κατέναντι τοῦ ἱεροῦ τῆς Ἀρτέμιδος, κυνήγιον μέγα πάνυ, καὶ κατέναντι τοῦ ἱεροῦ τῆς Ἀφροδίτης θέατρον.

Here the theatre is mentioned as opposite the Temple of Aphrodite. The Temple of Aphrodite on the Acropolis is mentioned twice by Malalas.[4]

3. SUIDAS, LEXICON[5]

> ὅτι Σεβῆρος ἦκεν εἰς τὸ Βυζάντιον . . . ἐφείσατο μὲν τοῦ φονεύειν, Περινθίοις δὲ καὶ αὖθις ὑπέταξε, καὶ παρέσχεν αὐτοῖς θεάτρου καὶ κυνηγίου στοάς.

The theatre is mentioned together with the Kynegion, from which one may conclude that the buildings lay close together. The Chronicon Paschale also mentions the Kynegion and the theatre in the same sentence.[6]

It is clear from these texts that the so-called Great Theatre lay on the Acropolis. The theatre was near the Temple of Aphrodite, and possibly close to the Kynegion. It was not on the southwest of the hill, but nearer the summit, to the northeast.

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[1] Du Cange, Constantinopolis Christiana, liber II, § 1.

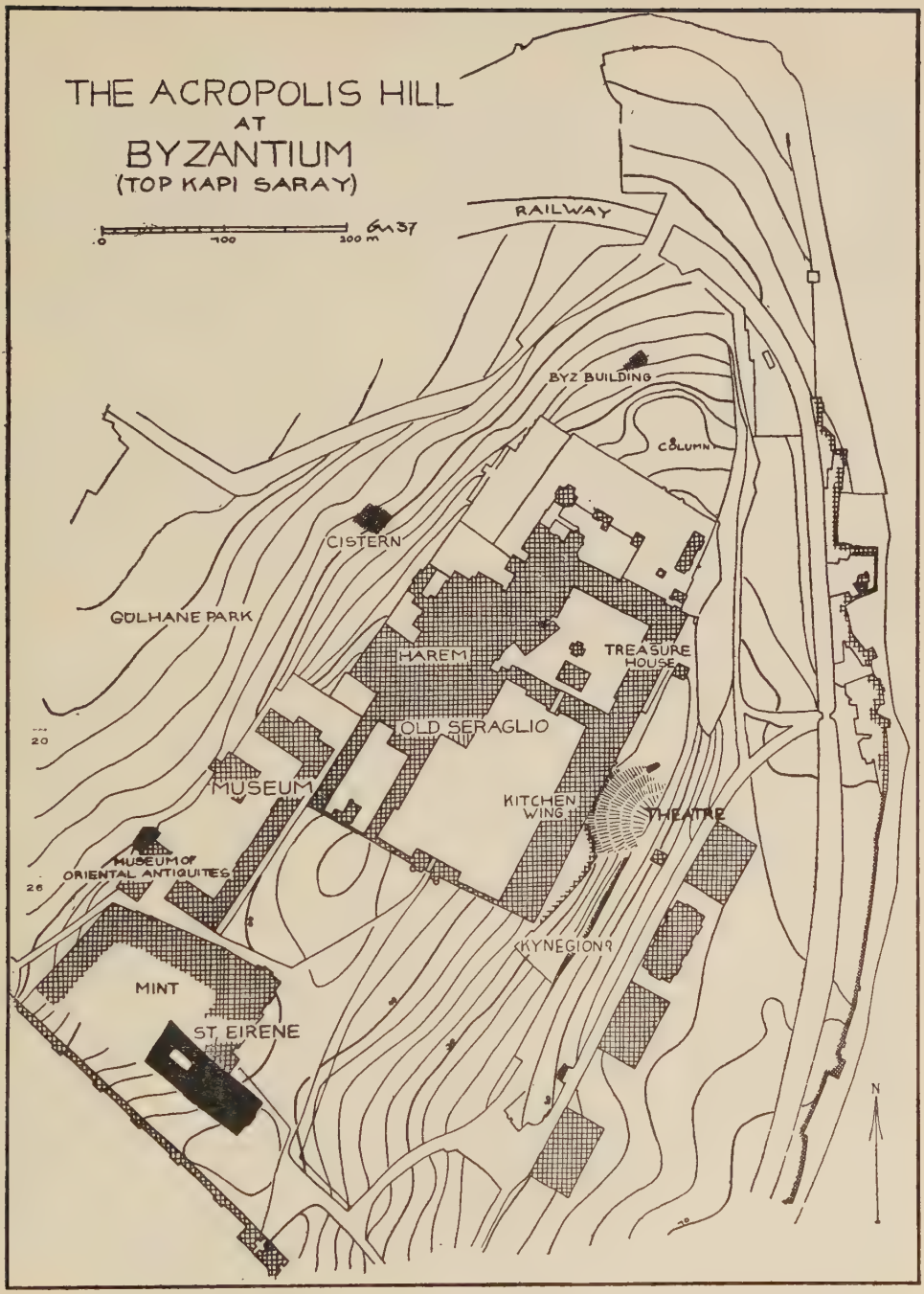
[2] Unless, through some mistake, this building and the Theatrum Minus of the second Region are the same.

[3] Bonn edition, 1832, p. 495.

[4] Bonn edition, 1831, pp. 324 and 345.

[5] Ed. Bekker, Berlin, 1854, p. 940, col. 2; p. 941.

[6] F. W. Unger, *Quellen der byzant. Kunstgeschichte*, Vienna 1878, p. 60, no. 779.


THE ACROPOLIS HILL
AT
BYZANTIUM
(TOP KAPI SARAY)
0
100
200 m
GM 37
RAILWAY
BYZ BUILDING
COLUMN
CISTERN
GÜLHANE PARK
HAREM
TREASURE HOUSE
OLD SERAGLIO
MUSEUM
KITCHEN WING
THEATRE
MUSEUM OF ORIENTAL ANTIQUITES
KYNEGION?
MINT
ST. EIRENE
N

Topography of the Acropolis Hill

The Acropolis of ancient Byzantium is today the fortress hill Top Kapı Saray (Old Seraglio), which was laid out and built over mainly during the 15th and 16th centuries. To provide space for these buildings, the hill was enlarged towards the southeast by massive supporting walls. It will not be possible to identify the temples inside the Saray grounds until trial excavations in the courtyards are undertaken. The theatre cannot therefore be located from references to the temples. The only course open is to study the peculiarities of the hill outside the Saray.

In recent times the Museum of Antiquities has been built on the western slope. To the northwest the entire slope is occupied by the Gülhane Park. On this side the hill shows no indentations which might justify us in identifying the traces of a theatre. The supporting walls of the Harem buildings stand throughout their length at a regular height of thirty metres above the sea, without any irregularities of ground level. The northeast slope is too narrow for a theatre to have been situated there.

The only area that remains to be examined, therefore, is the steep slope to the southeast of the hill. For a distance of 300 metres the hill is crowned on this side by the great walls of the Palace Kitchen and the Treasury. Because of the steepness of the ground they have been strengthened about the middle by five supporting buttresses.[7] If we stand below these walls facing the buttresses, we have on our left a peculiar terrace built obliquely to the main wall, supporting that part of it which forms the kitchen wing. On our right there is a corresponding undulation of the ground. In front of us and between these there is a semicircular hollow. On the left and below the terrace referred to, a Byzantine supporting wall runs parallel with the kitchen buildings at a distance of 25 metres from them : it is interrupted at this hollow.

The hollow, which breaks the even slope of the Fortress hill, is obviously of artificial origin. Its visible extent is about 100 metres in length, and perhaps 50 metres in width. Its shape leads to the conclusion that beneath its surface lie the remains of the theatre. It would be difficult in all Byzantium to find a more likely site for a Greek Theatre, and the suspicion that the theatre must have been built on this spot is strengthened by the existence of a pre-Byzantine wall which, from its position, may have been one of the side-walls of the

[7] Owing to reduction, the buttresses marked on the plan are not very clear.

tiers of seats on the northeast side of the theatre. Comparison with the Greek theatres of western Asia Minor leads to the surprising observation that the Theatre of Pergamon is almost exactly the same in size.

In conclusion, it may with some reason be claimed that the study of the topography of the district points to this hollow as the site of the theatre referred to in the texts quoted above ; but these theoretical observations cannot be verified except by the work of pick and shovel.

GÜNTER MARTINY.

MEGALITHIC COMPLEXES, TRANSJORDAN

The megalithic tower-complexes of Transjordan (see ANTIQUITY 1929, III, 342–4) are of interest not only in themselves but also because they have been compared with similar structures elsewhere. As a result of his recent exploratory tour the Director of the American School of Oriental Research in Jerusalem, Professor Nelson Glueck (in BASOR, no. 68, December 1937, 18–20) concludes that ' the *main* period of their history, to judge from the pottery remains, seems to be between the early 13th and the 8th-7th centuries B.C. '. It would thus appear that they may well be in part contemporary with similar structures at the other end of the Mediterranean.

We hope that investigators will not overlook the possibility, suggested by Dr Glueck, of finding ancient field-walls associated with them. That should be easy if they are found where later cultivation has not destroyed such vestiges ; although near Amman itself one has the impression that the *existing* field walls and lynchets, which are very massive, are themselves of a remote antiquity and perhaps contemporary with the towers. (After all, assuming that fields were in existence, why should later cultivators destroy them ? The labour of such destructive work would have been great and unremunerative, as we suggested in the case of the Cornish field-walls). It would be well worth while digging a trench through one of the ruined field-walls or lynchets, near the Amman tower for instance, to determine its age. Dr Glueck himself mentions some ' strongly terraced ' slopes near Shûnet Abū'Arabī.

Here is an obvious opportunity for air-photography to repeat its triumphs on fresh ground. That it can do so is proved by the first set of archaeological air-photographs ever taken, published by the late Dr Wiegand in 1920* ; and by those seen round the town of Umm el Jamal (ANTIQUITY 1937, XI, plate I opp. p. 456).

* *Wissenschaftl. Veröffentl. d. Deutsch-Türkischen Denkmalschutz Kommandos*, Heft 1, Berlin, 1920 : Sinai. (No other volumes were published).

In the same number of BASOR, Professor Albright concludes, on archaeological evidence set forth, 'that the Song of Deborah dates from between Megiddo VII and VI, in round numbers cir. 1125 B.C.', a date already suggested by him over a year ago. The Israelite occupation of the Shephelah of Judah would have taken place about a century earlier.

EXCAVATIONS AT GARRANES, TEMPLEMARTIN, CO. CORK*

An excavation of a large ring-fort at Garranes, co. Cork, has yielded results which are not only interesting but of first-rate importance for Irish archaeology. The excavation, which lasted two months and on which about twenty workmen were employed was financed as part of the State Employment Schemes under the direction of the Office of Public Works and the National Museum. It was conducted by Dr Seán P. Ó Ríordáin, Professor of Archaeology at University College, Cork, assisted by Mr M. J. O'Kelly and was carried out with the kind permission of the landowner, Mrs M. Crowley.

The site investigated is a very large ring-fort with triple ramparts—one of the largest of its type in the country—having an external diameter of about 350 feet. It is situated in a district which is particularly rich in such remains and this fact drew attention to the locality. At the end of the last century the late Canon Lyons suggested that this large fort was the site of the important royal residence of the Uí Eachach (a branch of the Eoghanacht, that later became the O'Mahony sept). The site is frequently mentioned in early Irish history under the name of Ráth Raithleann. It was at Ráth Raithleann that St. Finnbarr was born in the 6th century while his father was metalworker to the ruler there.

Because of the large area covered by the fort it was not practicable or useful to excavate the whole of it, and the attention of the excavators was therefore directed to certain areas. The entrance to the fort was completely investigated, trial cuttings were made through the ramparts to find the nature of the defences and a considerable portion of the inner part of the fort was excavated.

The entrance proved complex and most interesting. The discovery of a series of post-holes, cut for the most part in the rock, gave

* We wish to thank Mr P. P. Graves of *The Times* for calling our attention to this matter. A summary has already appeared in that paper and the full report was published in the *Irish Times*. The illustrations of some of the metal 'finds' kindly supplied us by the excavator of the site are from drawings by Mrs Ó Ríordáin.

evidence of the position of the gate-posts which guarded the approach to the fort. There were originally several gates—one standing at the

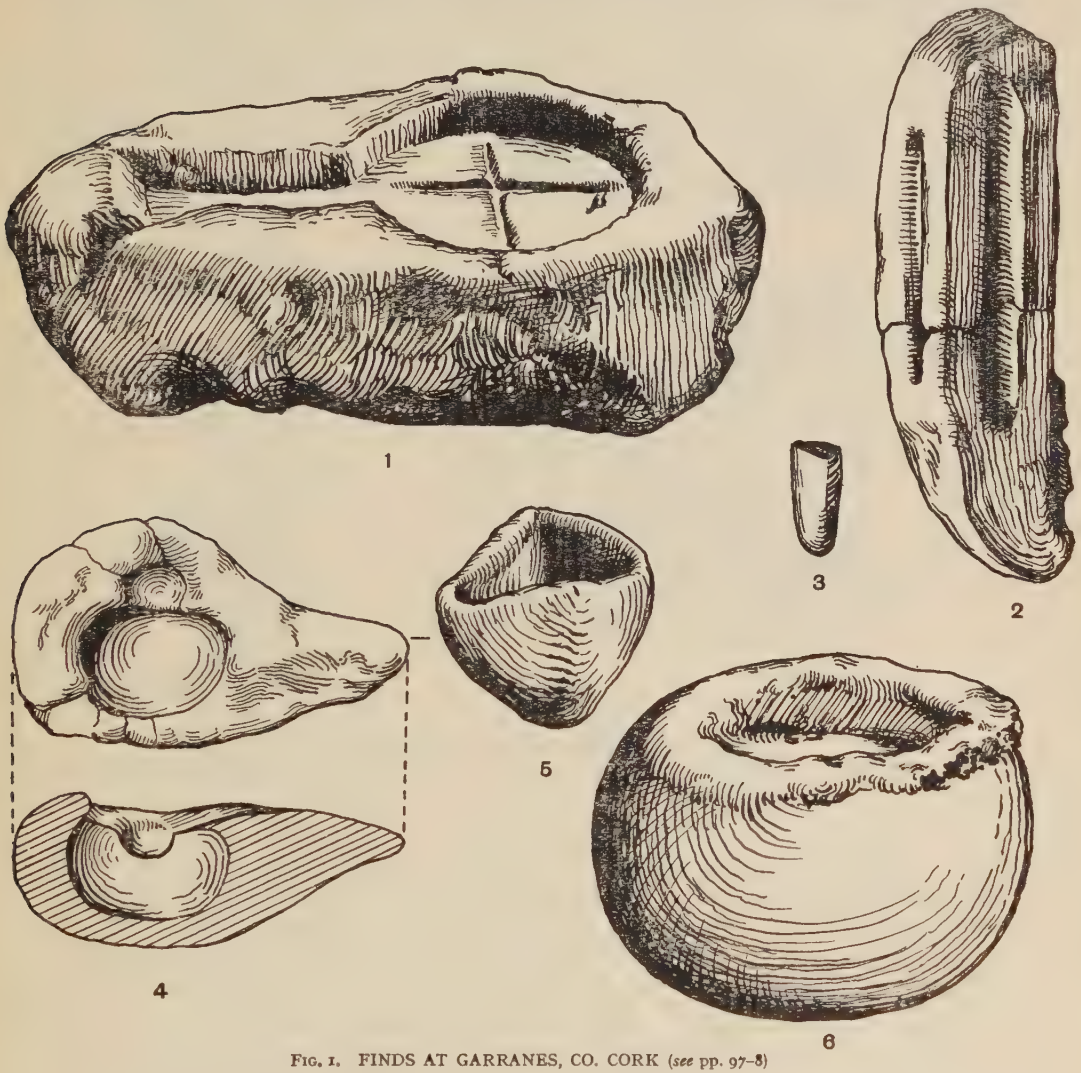


FIG. 1. FINDS AT GARRANES, CO. CORK (*see* pp. 97–8)

1, stone mould. 2, stone mould for metal ingots. 3, ingot cast from mould such as 2. 4, clay lamp. 5, clay crucible for melting metal. 6, spherical crucible for enamel. All $\frac{1}{2}$ except 4 ($\frac{1}{4}$)

ends of the outer bank, one at the ends of the middle fosse and a third at the ends of the middle bank. This bank terminated in two palisade

trenches, one at either side of the entrance. These trenches had held rows of posts—small tree trunks of about six inches in diameter—which formed a retaining palisade to keep the material of the banks in position and to narrow the entrance, the end posts of the palisade holding the fourth and final gate of the approach to the interior.

The ramparts of the fort were of earth and rock and the fosses had been cut to a depth of about five feet—into the rock, where this happened to come in the way of the fort-builders. Within the fort were found many post-holes of the wooden houses of the fort-dwellers and it was

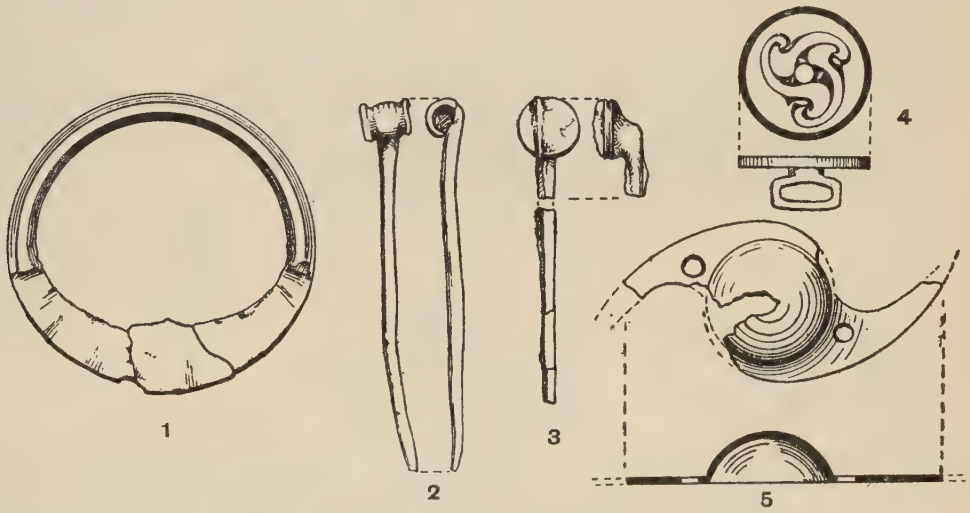


FIG. 2. BRONZE OBJECTS FROM GARRANES, CO. CORK
1, unfinished brooch. 2, pin of brooch. 3, unfinished pin. 4, button, silvered and with champlevé enamel. 5, ornament for attachment to leather? All $\frac{1}{2}$ except 5 ($\frac{2}{1}$)

also disclosed that at some period in the history of the site the inner bank had been strengthened and improved as a means of defence by piling against it and upon it large quantities of loose stones. On the southern side of the fort there was found under this layer of loose stones a deposit of dark material—charcoal and refuse of various kinds—and in this layer the majority of the finds were made.

From the nature of these finds and from the position in which they were found it was evident that the excavators had come upon the 'workshop' site of a metal-working community—probably the metal-workers who carried on their labours under the patronage of the ruler of the fort. Taking as a whole the evidence for the art- and metal-

working carried on in the fort, it points to the discovery of one of the most important of such sites yet brought to light in Irish archaeology.

Fig. 3. SIDE VIEW AND CROSS-SECTION OF STICK OF MILLEFIORE GLASS, GARRANES

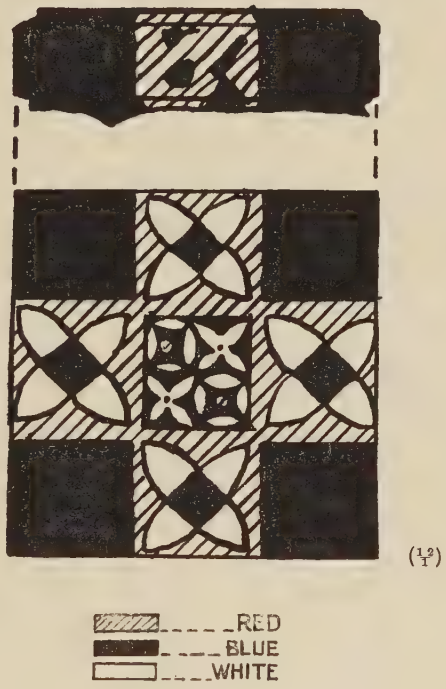


Fig. 4. DETAIL OF SMALL FRAGMENT OF MILLEFIORE GLASS, FOUND AT GARRANES, CO. CORK

Among the finds clay crucibles, whole or in fragments, were particularly numerous—the site has, indeed, yielded, more crucibles

than were known from the whole country previously. These crucibles, are usually pyramid-shaped, and were used to melt metal; in some of them was actually found the bronze or trace of the bronze for which they had been used. A second type of crucible found, not formerly recognized in Ireland, though known in Scotland, semi-spherical in shape and made of a soft stone, was used for the preparing of enamel, as is shown by the accumulations of that material around the edges (see FIG. 1).

Of the metal finds the best was a small bronze button, the surface of which had been silvered and bore upon the face a ' triskele ' ornament which dates it to the early 7th century. The spaces left around the ornament on the face had been filled with red enamel. Other metal objects included a bronze brooch in the course of manufacture—the marks of the worker's implements still recognizable upon it—and evidently discarded because it had cracked during the work. A bronze pin of another similar brooch was found, while another pin, also of bronze, was obviously cast and never finished, the marks of the joints of the mould in which it had been cast being quite clear (see FIG. 2).

An iron shears, such as is also found in crannógs, was discovered, as also were some small knife-blades and a pincers which might have belonged to the stock of a blacksmith.

More interesting and more important than the iron material was the discovery of some fragments of glass and several pieces of millefiori glass (made by fusing different coloured rods of glass together and pulling them out so as to lessen the diameter of the resulting composite rod). Such millefiori glass is made in rods and is then cut for insetting in ornaments The circumstances of its discovery at Garranes, where rods of it were found as well as rods of single-coloured glass as would be used in its manufacture, proves that the millefiori glass found on Irish ornaments was a native product (see FIGS. 3–4).

Moulds of stone and clay for the casting of the metal objects were also found. One of the stone moulds was of a peculiar and unique type—evidently intended for the casting of small mirror-shaped objects with a rude cross upon them (see FIG. 1, 1).

A considerable quantity of pot-sherds were found. Most were fragments of Roman amphorae and some were of cooking-pots also of Roman type. This is of interest in view of the fact that only a few sherds of Roman pottery have been discovered in Ireland hitherto.

The main significance of the excavation is the evidence it provides of an intense metal-working tradition on a site datable to the early centuries of Christianity in Ireland. It shows further the necessity

for much more investigation of the ancient forts (of which there are at least 30,000 in the country) and also the importance of excavation of habitation-sites as a means of obtaining an insight into the everyday life of early times.

All the finds are housed in the Museum at University College, Cork.

PEN DINAS, CARDIGANSHIRE

Professor Daryll Forde reports :—

A short period of excavation during the past summer has completed four seasons of work on Pen Dinas hill-fort. It is now clear that there were three periods of occupation on this dominating site, which lies between the converging estuaries of the Ystwyth and Rheidol rivers in Cardiganshire. The earliest site was an oval fort with a single entrance defended by a single bank and ditch on the level plateau at the northern end. The outer face of the bank was supported by timbers set up in a revetment trench reminiscent of that found at Hembury.

At a later period the rocky southern knoll on Pen Dinas—below which the ground falls very steeply on two sides for nearly 400 feet to the Ystwyth river and the shore—was fortified on the landward side by an independent series of defences of much greater strength than those which had been constructed in North Fort. The northern fort was probably abandoned at this time.

The main bank of South Fort, strengthened by an outer revetment built mainly of large pebbles carried up from the beach, was breached by two gateways giving landward access by gentle slopes. Sherds of Iron Age B pottery and a glass bead of a type characteristic at Meare lake-village were recovered from occupation layers on the inner side of the main bank.

In the final period the two earlier defended sites were linked together by low banks and on the landward side by a shallow ditch. The gateway which gave access to the narrow linking waist began as a wide driveway, but was narrowed and strengthened later with timber supports and gate posts so that an attempt could be made to defend the entire summit of the hill. Ditches in both North and South forts had been filled for a considerable distance at the points where the linking banks connected the earlier fortified areas. Interesting constructional details were observed in these areas and in one place sherds of Iron Age

B pottery were recovered from the surface of the ditch filling at the foot of the crossing bank.

Although the defences were ruinous in places there was no evidence of wholesale demolition of the fortress and no Roman artefacts were found.

THE CHILDREN OF ISRAEL

Readers of the article in ANTIQUITY (' The Israelites in Sinai ', 1932, VI, 434–44), by Major C. S. Jarvis, late Governor of Sinai, may be interested to read a fresh and concise presentation of his theories in the current number of the *Palestine Exploration Fund Quarterly* (January 1938, 25–40). Major Jarvis's brilliant identifications are coming, it seems, to be generally accepted. He believes that the Children of Israel left Egypt by a route along the sandspit of Bardawil, dividing the lagoon (the Yam Suf or Reed Sea) from the Mediterranean ; and that the forty years wanderings took place in the northern part of the Sinai peninsula, particularly the region south of El Arish and Rafa, where alone could they grow the food they required. The case for this view is a very strong one, and the theory fits the recorded facts quite well. The field archaeologist has once more justified his methods.

EARLY MAPS

We have received several communications as to the identity of places on the Bodleian map illustrated in the December number of ANTIQUITY, p. 488. Owing to great pressure on our space reference to them must be deferred for publication in the June number.

Varia

The Editor is not always able to verify information taken from the daily press and other sources and cannot therefore assume responsibility for it.

It is not always easy to account for the multilation of barrows, especially those in lonely and isolated spots on the downs. A possible cause of some instances is suggested by a remark of John Byng's (*Torrington Diaries* [1787] I, 1934, 252–3) :—' Some miles above Wantage I pass'd by a very magnificent barrow ; and saw a smaller one, judiciously scoop'd out for a shepherds cot '. Byng was riding along the Berkshire downs from Aldworth to Wantage, and it is possible that the scooped barrow may have been Scutchamer Knob.

It has always seemed to the writer that, judging from its shape, and more especially from the straight angular course of the parish boundary, the town of Woodstock must formerly have been surrounded by walls. Inspection of the line described, however, produced no result ; though a more thorough investigation with the spade might well do so. A passage in the *Torrington Diaries* (1787) certainly seems to lend colour to this suggestion :—' The worst thing abt. Blenheim is the vicinity of the Town [of Woodstock], whence come eternally all the horrid noises of dogs, bells, etc., etc.—surely the Duke of M : shou'd *along the wall of the Town* [our italics] leading from the entrance, plant copiously, and not permit the full gape of all those houses upon his park '.

Celtic fields associated with a habitation-site have been found near Sarrebourg (Moselle) by Mr C. E. Stevens, whose account of them is published in *Revue Archéologique*, Jan.-Mar. 1937, pp. 26–37.

In the *Transactions* of the Rhodesia Scientific Association, XXXIV, part 2, Aug. 1936, pp. 10–18, Miss Caton Thompson disposes of some criticisms published by Dr Laidler in a previous number of the same publication (XXXIV, part 1, Dec. 1934).

Those wishing to keep abreast of recent work on Hadrian's Wall cannot do better than obtain the masterly summary recently written by Mr Ian Richmond, of King's College, Newcastle-on-Tyne, called ' Recent Research and Hadrian's Wall ', printed in *The Heaton Works Journal*, December 1936, pp. 286–300 (Messrs C. A. Parsons, Newcastle).

Prof. Watson's explanation of the origin of the island-name Iona was touched upon and summarized in ANTIQUITY, 1933, VII, 464–5. It appears to be connected with the Celtic word for yew-tree ; but it has always seemed difficult to accept—at any rate it seemed so to the present writer—because of the extreme rarity of yews growing naturally in the Western Isles. This difficulty is to some extent resolved by the mention of a yew-wood existing in the middle of the 18th century on the island of Berneray, lying between Harris and South Uist, outer Hebrides (Defoe's *Tour*, IV (1742), 255). It would be interesting to know if it still exists and whether others are known in the Western Isles. No trace of this wood, or any other, appears on the large scale Ordnance Map (Hebrides &c., sheet 26 ; ed. of 1904).

The discovery in 1936 by L. N. Solov'ev of several ' eolithic ' sites [in Abkhazia, U.S.S.R.], is reported. The most important are near Andreevskoe and Neidorf (Neudorff). At Andreevskoe ashes, charcoal and numerous wooden implements (awls, pins and other pointed tools predominating) were uncovered in a stratum of peat. The largest specimens included hoes, some of which had near the pointed end twisted (or braided) thongs of vegetable fibres. The same cultural layer yielded animal bones and flint and limestone, unretouched implements of ' eolithic ' type. From the geological evidence this site was attributed to the Mindel glaciation. In a stratum of interglacial peat, overlaid with thick moraine deposits, another discovery of many well-preserved wooden implements, typologically akin to those from Andreevskoe, was made in the neighbourhood of Neidorf near Sukhum. No stone tools were present.

We quote the above summary with all reserve from the *American Journal of Archaeology*, XLI, Oct.-Dec. 1937, pp. 618–9, where full references are given.

Since the publication by Mr G. C. Dunning and the writer of an article on Roman Barrows in ANTIQUITY, March 1936, an unrecorded example has been located in East Kent by Mr M. D. Collier, a member of the Kent Archaeological Society.

It is situated in the parish of Stowting, in a small copse adjoining the western side of the Kentish Stone Street, 550 yards north of Round Down Wood (Kent 6-inch sheet 66 SW). The barrow is 9 feet in maximum height, 81 feet in diameter, and 270 feet in circumference ; it is but little spread, and there is no ditch. It has the flattened top characteristic of Roman burial-mounds, and its position hard by the side of a Roman road is a further reliable clue to its date. There are no signs of any excavation, and the barrow, which at present has young oak trees and wild nut bushes growing on it, is in an excellent state of preservation.

R. F. JESSUP.

Miss M. V. TAYLOR, F.S.A., writes :—

' Dr F. O. Waagé's protest against the misuse of the word " Samian " to describe pottery made in Gaul is timely (ANTIQUITY 1937, XI, 46 ff). As he says, the word should be kept for the pottery now known to have been made in the island of Samos itself. But why perpetuate the equally incorrect word " sigillata " for pottery which is not stamped ? Why should not the so-called " Samian " be called what it is—Gaulish varnished ware or Romano-Gaulish varnished ware or Gaulish-Arretine ware, whether it is plain or bears a stamped pattern ? And in England at any rate it is not even now too late to drop the ugly and false " sigillata " which has only crept in during the last twenty years or so and has never been popular. Precision, correctness and brevity together sometimes justify the use of foreign words and phrases for describing technicalities ; brevity alone is insufficient ; when incorrectness is added the use is inexcusable '.

Three years ago Mr Leigh Ashton published a Chinese Bronze of the Huai style, ascribed to the period of the Warring States (481–206 B.C.) dug up at the Dane John in Canterbury : now comes the news of another of similar style dug up in Rome.* The problem of how

* Birgit Vessberg in *Bull. of the Mus. of Far Eastern Antiquities*, Stockholm, no. 9, p. 127.

they came to Europe is unexpected. Such things did not fall into the hands of the collectors of Chinoiseries in the last two centuries, and, unlikely as it seems, they must have come across along the silk route in the early centuries A.D. E.H.M.

It is good news that ' two volumes of a definitive work by Dr Reisner, The History of the Giza Necropolis, are ready ', and that the first volume was to go to press in the autumn of last year. Their publication will be an event of the first importance, not only to archaeologists but also to students of art. From the plundered mastabas near the Pyramids, Dr Reisner has recovered not only a mass of information about the people and rulers of the Old Kingdom, but also some relics, such as the alabaster portrait-heads, of unsurpassed artistic excellence. The writer well remembers the thrill of participating (in the capacity of a learner) in some of this work just a quarter of a century ago. The quality of Old Kingdom art has rarely been reached by the art of any other period or region ; but authentic specimens are not common, and popular judgment of Egyptian art is usually formed by inferior examples of later ages.

Ancient habitation-sites on Kodiak Island, one of the Aleutian Islands, are spotted by the vegetation which grows upon them. ' The accumulated deposits of a village, ranging in depth from a yard or so to 16 feet, contain ashes, shells, sea-urchin spines, rotted wood and soil, bones of fish, birds and mammals (including whales), blown dust or silt, organic refuse of all sorts '. This organic soil is naturally much more fertile than the rest. ' The sites were covered with stinging nettles and wild parsnip ; over burial-sites elder-berries were common. One site at Uyak Bay was covered every year with handsome forget-me-nots, the only ones found in the region. Monkshood and fireweed were other prominent indicators of sites '. (*Time*, 27 Dec. 1937, summarizing an article by the excavator of the sites, Dr Hrdlička, in the previous number of *Science*).

Standardization is one of the penalties of the use of machinery. Its tyranny is felt by all proof-readers, and the following opinion provides an amusing contrast. It is that of Andrew Simson who

changed from minister of Kirkinner, a Wigtown parish, to a printer at Edinburgh. ' 'Tis probable ', he says, ' some criticks will find fault with me for not using an uniform manner in spelling and pointing. But in regard our greatest criticks have not, for anything I know, given us an exact standard, either for the one or the other, and these sheets being *set* by two or three *compositors* at the same time, and each of them spelling and pointing differently, when it came to me to revise, I was not very nice in making several alterations of what they had done, knowing that I could produce sufficient authority from learn'd authors for each of them '.

The Trustees of the National Gallery have recently purchased four panels claimed to be by Giorgione (*c.* 1478–1511) for the sum of £14,000. (*The Times*, 30 Dec. 1937).

For the safeguarding of Britain's oldest and finest prehistoric monument, Avebury, the sum of £11,000 is asked ; the whole of this sum has to be obtained from the public by voluntary subscriptions.

As we go to Press information has reached us that a second original entrance, through the Bank and Ditch of the Circles of Avebury, has been identified during the excavations at present in progress in the north-western sector of the monument, undertaken by the Morven Institute of Archaeological Research under the joint direction of Alex. Keiller and Stuart Piggott. The causeway of this northern entrance would appear to run obliquely under the present Avebury-Swindon road in a north-westerly, south-easterly direction. Further details will not be available until the completion of the excavation, but it would appear not improbable that this entrance led in a direct line to the centre of the northern interior setting, even as the final section of the West Kennet Avenue, if produced, would have led to the centre of the southern interior setting.

Reviews

ANCIENT EGYPTIAN PAINTINGS selected, copied and described, *by* NINA M. DAVIES with the editorial assistance of ALAN H. GARDINER.[1] 104 *coloured plates in* 2 *vols., folio, and descriptive text in* 1 *vol.* (Special publication of the Oriental Institute of the University of Chicago) *University of Chicago Press*, 1936.

It is no exaggeration to describe this as the most finished work on Egyptian art that has appeared during the last decade. Mrs Davies, who is herself a painter of distinction, and her husband, the well-known Egyptologist, N. de G. Davies, have worked together in Egypt, winter after winter, for some 25 years. Mr Davies has surveyed the rock-tombs of different periods and in various sites, while his wife has copied the beautiful paintings in the tombs. The original copies are mostly in the possession of Dr A. H. Gardiner, though some are in the Metropolitan Museum of New York, and 22 have lately been acquired for the British Museum. Complete accounts of all the tombs where copies have been made have not yet been published, for it proved too expensive for all the available copies to accompany such accounts as have appeared, if the colours were to be reproduced as closely as possible. In this way a considerable collection of copies accumulated, and there was no prospect of their being made accessible until the matter was taken up by Dr Gardiner, who from the beginning had given Mrs Davies every encouragement in her work. Now, with his editorial assistance and the help of Mr Rockefeller, 104 of the best copies are available, many of them reproduced on the original scale.

Selection was very difficult, as both artist and editor point out, and the connoisseur will probably find some of his favourites absent, while others are included which he will think might have been omitted. Naturally such a choice is highly subjective. Copies from the Theban tombs of the New Empire predominate, in particular those of the 18th Dynasty (*c.* 1500–1350 B.C.) ; that is quite as it should be, for the majority of the coloured paintings still extant come from Thebes, and it was here that Mr and Mrs Davies made their head-quarters. One is tempted to think that there would have been an actual gain if only Theban paintings had been chosen, although in this case greater stress would have had to be laid on the paintings from tombs of the 19th-20th Dynasties which are generally, though wrongly, neglected. A few copies from the tomb of Antefoqer (Middle Kingdom), and some from tombs of the late period (*e.g.* Pabasa, 26th Dynasty) would have effectively rounded off a publication of exclusively Theban tomb-paintings. But even so, the Theban paintings

[1] Translated by Professor R. G. AUSTIN.

are inexhaustible : here for the first time one finds paintings from the beautifully preserved tomb of Menna (no. 69, pl. 50–55), and from the hardly less important tomb of Djeser-ka-re-seneb (no. 38, pl. 36–37). An effective stylistic contrast to these is formed by the splendid paintings from the tomb of Amenemheb (no. 78, pl. 38–41, negro dancers, pelicans). Such a bewildering variety of paintings is here to charm the eye that no one will now wish to uphold the claim that the tomb of Nakht (no. 52, pl. 47–48), the best known and most often visited of all the Theban tombs, is the only one really worth seeing. It might perhaps have been desirable to omit the reproduction of some coloured temple-reliefs (pl. 12–13, 86), which in fact belong to a different family of paintings, and to include a few more specimens from the 19th–20th Dynasties. The strong colouring of that period is very attractive, as well as the high relief of the figures and the deep religious spirit which so many paintings reveal even if the vivid scenes from every-day life recede into the background. For example, I should regard plate 102 (water-drinking under a palm-tree) as a specially happy example of the painting of the Ramessid period. One cannot simply dismiss this art as retrograde and decadent.

The Theban paintings, which preponderate, are introduced and interspersed here and there by some from the Old and Middle Kingdoms and from the Amarna period. Apart from the geese from Medum, that strangely mature painting of *c.* 2800 B.C. (pl. 1), the Theban work gets much the better of the comparison. The reason is not that the earlier art reached a lower standard, but that it produced far fewer actual paintings (excepting the painted reliefs), thus providing a much more limited choice. Further, details of coffins (pl. 5–6), however subtle in themselves, cannot really make up for what is lacking. Probably, therefore, it would have been advisable to abandon the plan of including examples from the earlier periods. The art of Amarna, not so characteristically in evidence at Thebes as at Amarna itself, is chiefly represented by the charming bird-pictures from the ' green room ' in the North Palace (pl. 75–6). It has already been pointed out by H. Frankfort,[2] in the original account of the Amarna paintings, how instructive the comparison of these bird-pictures with the ' birds in the tree ' from Beni Hasan (pl. 9, Middle Kingdom) is for showing the stylistic development of the different epochs. Even the whole-hearted admirer of Tutankhamen finds something to his taste, for here are two fine reproductions, practically on the original scale, of two sides of the chest covered with battle and hunting scenes (pl. 77–8).

[2] H. Frankfort, *The Mural Painting of El-Amarna*, London 1929. In view of the comparison here mentioned, and of numerous others which suggest themselves in running through the pages, it must be regretted that Mrs Davies' paintings are bound up in two volumes, instead of being on loose sheets in a portfolio : this would have made them much more useful for purposes of comparison.

The text contains concise and competent descriptions of all the paintings ; but its chief value lies in the introduction, where Mrs Davies, from the fulness of her experience, discusses the technique of ancient Egyptian painting. The common term ' fresco ' is incorrect : as she shows, work so described is really ' mural painting ', with colours in tempera on a stucco foundation. The pigments used are mineral, such as ochre, malachite, azurite, etc. The only still doubtful question is that of the means used for binding the pigments. Therefore, in these mural paintings we find basically the same procedure as occurs again in the Roman period, in many of the mummy-portraits from the Fayum, which in essentials remained unchanged until the invention of painting in oils by the brothers Van Eyck.

It is precisely in connexion with the methods of painting peculiar to the Egyptians that sufficient praise cannot be given to the exact colouring of these copies. Mrs Davies stresses the point in her introduction, remarking ' the value of my contribution depends wholly upon the degree of faithfulness to the originals '. I consider that for ' faithfulness to the originals ' nothing could surpass her work. If one compares it with the coloured reproductions in older publications, such as those from the tombs of Beni Hasan in Newberry and Griffith's book, then Mrs Davies' achievement can be fully appreciated. Further, it is not merely a question here of outward fidelity to outlines—bearing in mind, of course, the damage suffered by the originals—and to colouring. There is something more : the artist has clearly got within the skin of the Egyptians, so to speak, where their methods of drawing and painting are concerned—she has, in fact, a profound insight into Egyptian art, with a consequent understanding of the mind of Egypt. A. SCHARFF.

ARCHAIC SEAL-IMPRESSIONS. Ur Excavations, vol. III. *By* L. LEGRAIN, with an introductory note by SIR LEONARD WOOLLEY.* *Oxford University Press*, 1936. *pp.* VIII, 51 *and* 58 *plates*. 32*s* 6*d*.

For our knowledge of the development of archaic art in Babylonia we are largely dependent on seals and their impressions made on clay jar-stoppers. Since A. Moortgat treated the subject so admirably in his *Frühe Bildkunst in Sumer* (1935), we have been able to recognize four main divisions of archaic glyptic art : the earliest large group of seal-impressions which we possess goes back to the fourth stratum in Uruk (*c.* 3300 B.C. upwards, assuming a conservative chronology), representing ritual-subjects, battle and hunting scenes, and in particular, animals fighting with each other. Besides those in which the animals are shown true to life, there are others where they appear drawn in heraldic style. Characteristic of the whole group is the predilection for plastically-

*Translated by Professor R. G. AUSTIN.

worked relief. The next stage in development is the Jemdet Nasr group (*c.* 3200 B.C. upwards), named after a small ancient site in north Babylonia ; in general the principles of the previous group are continued, conventional beasts being frequently shown in front of temples or domestic animals before their stalls made of rushes. The succeeding group is named by Moortgat the Mesilim epoch, after the earliest ruler historically known to us ; but in spite of numerous points of likeness between it and the Jemdet Nasr group, there is a break in the line of development between the two. In the formation of the individual figures, the plastic relief of the earlier age contrasts with the later plane delineation with stressed outlines ; out of the traditional stock motifs, the ' figure-band ' develops. By way of an important intermediate stage, belonging to the same period as the great collection of clay tablets from Fara (Imdugud-Sukurru type, from a name found on a seal at Fara), the art of the Mesilim period continues in the last division of archaic art, the Urnanshe and Lugalanda group, called after rulers so named, *c.* 2850–2750 B.C.

The material from Ur made available by Legrain consists mainly of seal-impressions from jar-stoppers, chiefly found in a stratum of débris immediately below the famous royal cemetery, for which the excavator has coined the name ' seal-impression stratum IV–V '. From their position they doubtless belong to an earlier period than the cemetery, and this difference in date has importance, for it was not until after considerable masses of débris had been deposited over the seal-impression stratum that the graves were made. A fairly satisfactory date is made possible by the finds of clay tablets there with the stoppers, which Father E. Burrows has published (*Archaic Texts*, 1935). Their script suggests that these tablets may have a close connexion with the latest stage in development of the Jemdet Nasr script : a fairly large gap in time separates them from the next group after that, the Fara tablets. Since we can place the Fara tablets as coeval with the Imdugud-Sukurru seal-type, we get for the seals from stratum IV–V at Ur the period from the end of the Jemdet Nasr epoch to the Mesilim epoch inclusive. The presence of finds which must be placed at the least in the Jemdet Nasr age should not invalidate these limits, for a seal may have been in use over a long period ; on the other hand, such seals found in this stratum as are of a demonstrably later date (no. 476, already noticed by Legrain, and especially nos. 298–300) must have found their way there when the overlying strata were disturbed.

The motifs of the seal-impressions from stratum IV–V can mostly be derived from the Jemdet Nasr art. I may mention the following : lines of animals walking and lying down, animals gnawing at a tree, cows coming out of their stalls, generally with a naked man preparing butter in jars, a motif which still lives on in the mosaic friezes of Kish and Tell el-'Obēd.

It is not easy to find in Legrain's material seal-types demonstrably belonging to the Mesilim period. There is none with the unmistakable ' figure-band ' in the Mesilim style, such as we know from the Fara seals and again lately from H. Frankfort's excavations in Khafaje and Tell Asmar (northeast of Baghdad) ; this is remarkable, as it turns up sporadically among the seals in the royal cemetery. One would like to assign to the Mesilim period those seals depicting warriors wearing a long pleated garment girt up high in front, for such a costume is frequently found at that time, the chief example of it being in the mosaic frieze in the palace at Kish. However, the style of these seals is against such attribution : it brings them into line rather with the group deriving from Jemdet Nasr. We may probably conclude that the finds from seal-impression stratum IV–V date from a period anterior to the development of the Mesilim style.

The most characteristic seal-type from this stratum is that which interweaves into a whole archaic letters with linear designs, or shows letters only in a fan-shaped and columnar arrangement already familiar from the clay tablets. Representations of this type have hitherto only been found at Uruk, in a stratum of like date, and in Fara. For the present it is not possible to conjecture the meaning of the lettering, which is not surprising in view of our limited knowledge of ancient writing. Several times place-names apparently occur, such as Ur, Uruk, Larsa. It should be emphasized that this type of seal has no connexion with earlier times nor does it appear again later. It may yet be of the highest importance for archaic chronology.

I ought perhaps to note the seal-types that might be expected in the stratum, but which in fact do not appear. These are, first the type of short, thick, roll-seal with animals, done in rough *Kügelbohrtechuik*, and in particular the seals in which the animal-figures of the Jemdet Nasr period are transformed into linear designs. According to Frankfort it is precisely this type, so important for the earliest part of his Early Dynastic period, which forms the transition-stage from the Jemdet Nasr to the Mesilim epoch.

To sum up, the seals from stratum IV–V may be judged to be descendants of the Jemdet Nasr art, from which they differ chiefly in showing less regularity of composition and a lack of repose foreign to the Jemdet Nasr type.

A. FALKENSTEIN.

ARCHAEOLOGICAL RECONNAISSANCES IN NORTH-WESTERN INDIA AND SOUTH-EASTERN IRAN. *By* SIR AUREL STEIN. *Macmillan*, 1937. *pp.* XX, 267, *with* 60 *plates*, 18 *plans*, 4 *maps*. 63*s*.

In August 1930 Sir Aurel Stein started on his Fourth Central Asian Expedition, under the auspices of the Harvard University. Ten months later

his work was cut short by the machinations of Nanking agitators ; his finds were confiscated. Sir Aurel promptly decided to carry out an alternative plan, and follow up in south Persia the clues he had already discovered in British Baluchistan, linking the prehistoric civilizations of the Indus with those of the Tigris and Euphrates.

Before starting for Persia Sir Aurel found time for a short trip to the Salt Range area of the Punjab, to clear up some moot points connected with the Indian campaign of Alexander the Great. Synopses of this tour and of his Persian journeys have already appeared in various periodicals. Two of the latter and the Punjab operations are now published in full in the volume under review.

That Alexander traversed the Salt Range by the Nandana Pass and crossed the Jhelum (Hydaspes) opposite Jalalpur may now be taken as certain ; Sir Aurel's points against a crossing higher up that river are conclusive. The exact site of the battle with Porus will probably never be known ; the westward shift of the Beas (Hyphasis), as Sir Aurel shows clearly, must long ago have obliterated the altars which Alexander set up on its bank.

Before the discovery of the ' Indus Civilization ' archaeologists had failed to make Indian pottery ' talk '. The sudden emergence of ' Indo-Sumerian ' affinities set people guessing. Sir Aurel at once saw the need to test speculation by evidence, and, with pottery as his main clue, he began to probe into the archaeologically almost unknown country beyond the Indus. Two rapid tours (1927–8) through Waziristan, Upland Baluchistan and British Makran (Gedrosia) revealed a series of ' chalcolithic ' cultures, the affinities of which with the ' Iranian Highland Culture ' have been neatly summarized by Dr. Frankfort in ANTIQUITY 1932, VI, 504–7. Precise dating cannot be expected in ' reconnaissances ' so far-flung ; for want of time and labour, digging is rarely possible. But no one knows better than Sir Aurel how to choose a likely spot, and he did succeed in getting stratigraphic evidence to support the culture-sequence suggested by style.

Of his Persian journeys the first took him through Persian Makran and the hills that lie behind it into the Jaz-Murian depression and thence over the uplands to Kerman ; the second from Kerman to the coast at Minab (Old Hormuz, east of Bandar Abbas) and along it to Bushire. (The third journey, in Fars, is fully published in *Iraq*, October 1936).

Of the areas traversed the most interesting is the Jaz-Murian basin, the southernmost of the arid depressions that separate Persia proper from Khurasan. Fanuch, on the threshold, yielded chalcolithic and ' late prehistoric ' pottery and ' cairn burials '. The Bampur oasis on the east is full of typical chalcolithic sites, of which Khurab, with its funerary pottery linking Susa I with Shahi-tump

in British Makran, is the most prolific. The incised steatite and imitation-steatite vessels of this area (pp. 109, 117, 121) also point to Susa. On the westward trek of 163 miles from the Bampur river to the Halil Rud (an ethnic divide between Persian and Baluch) only early Islamic pottery was found, always associated with *qānāt* irrigation, a fact which confirms Sir Aurel's view that irrigation by underground channels was not known to chalcolithic folk. The valley of the Halil Rud shows evidence of a shift of the population upstream, due presumably to progressive desiccation, the chalcolithic sites being on its lower course only, ' later prehistoric ' and pre-Muslim settlements are higher up, and early Islamic still higher. Near the head of the valley, the debris of Shahr-i-Daqianus supports the identification of that site with the Jiruft of the early Arab geographers, and the ' Camadi ' of Marco Polo, a flourishing trade centre which was ruined by the Mongols.

In the Kerman highlands chalcolithic pottery was found at Tal-i-Iblis, some 40 miles southwest of the capital, and traces were seen on the way to Minab, but the coastal plain, both of Persian Makran and the Gulf right up to Bushire, yielded none. This Sir Aurel at first took as evidence against the existence of maritime intercourse between the Gulf and India in prehistoric times, but an alternative explanation is suggested later by signs of subsidence along the Gulf shore. Chalcolithic pottery, however, with button-seals like those of Arpachiyah, was found in the Galehdar valley in the near hinterland of Tahiri, and close to Bushire, in 1913, M. Pezard excavated an Elamite settlement, with bricks inscribed in cuneiform, overlying pottery of Susa I and II. Perhaps the routes between Bampur, Sistan and the Kej valley in British Makran have something on the point to reveal.

' Cairn burials ' were found in Persian Makran, in the hills behind it, in the upper Bampur basin and north of Kerman, but not on the Gulf coast. Sir Aurel has tentatively assigned them to the ' early historical ' (Parthian) period on the evidence of similar sites in British Makran. The bits of bone found in them indicate a ' Zoroastrian ' type of disposal, the bodies being first exposed to wild animals ; only the fragments remaining were interred. It is not possible yet to determine the upper and lower limits in time of this practice, and Damba-Koh in Makran, with its 1700 cairns, is puzzling, for its pottery bears patterns with chalcolithic affinities.

The ruins of the great maritime cities of Siraf (Tahiri), Tiz and Old Hormuz yielded vivid proof of the wealth of Islam in the darkest hours of European history. Cliff-bound Siraf in particular, with terrace on terrace of closely packed mansions, its aqueducts and rock-cut cisterns, and its planned ' Campo-Santo ', Sir Aurel not inaptly compares with the Genoese Riviera. The dating (A.D. IX, X) of these early Muslim sites is assured by sherds of Samarra and

Brahmanabad (Mansura) types, and Chinese porcelain, discussed by Mr R. L. Hobson in a concise appendix.

Sir Aurel has no use for archaeological work which is not supported by ' exact topographical information '. He took with him to Persia Muhammad Ayub Khan of the Survey of India, to whose help is due a plane-table survey of most of the 2400 miles of appallingly difficult country over which they marched, and site plans, some of them most intricate, of a dozen of the mounds examined. The results of the survey are embodied in two superb coloured maps. (In a few cases the marking of ancient sites does not tally with the text). To Mr F. H. Andrews is due the thoughtful grouping of the illustrations; the plates, especially those in colour, are among the most useful features of this book.

By his courage and tenacity in the teeth of daunting difficulties, political and physical, Sir Aurel Stein has proved, beyond cavil, the continuity of the Iranian Highland culture from the Indus to the Tigris. An early phase is suggested by the rectilineal decoration of some of the pottery from the Bampur area, a later phase by polychrome ware ; but to confirm this, stratified evidence is not forthcoming. Indian influence (bull, *pipal*-leaf, goddess-figurines) is here conspicuously absent ; the ibex is all-pervading (*e.g.* pl. VII). Curiously, not a trace was found of the palaeolithic and neolithic cultures in which peninsular India is so prolific ; how they got there is still a puzzle. The evidence for the ' late prehistoric ' and/or ' early historical ' periods is still rather nebulous. To compare this Persian material with that published in many bulky volumes by Sir Aurel and others from India, Sistan and Central Asia is not easy ; a handy synopsis of forms and patterns, with an analysis of the distribution of each would help future study. But, as pointed out by Dr Frankfort in his review of *Gedrosia*, ' reproductions, however adequate ' cannot elucidate the ' technical qualities and processes of manufacture ' so important in unravelling the problems of the Ancient East. It is good news that some of these Persian sherds are now in the British Museum, and it is to be hoped that, in due course, the ' chalcolithic ' specimens will find place alongside those to which they are most closely allied ; including, perhaps, a few from British India.

F. J. RICHARDS.

OXONIENSIA : vol. I, 1936 (*Ashmolean Museum, Oxford*).

ULSTER JOURNAL OF ARCHAEOLOGY : 3rd series, vol. I, part I (January 1938).

We cordially welcome these two new publications. They are additional evidence of that remarkable renascence of human studies which has taken place during the last two decades. It is proper that Oxford should at length become

involved, for the Oxford district is the heart of England and may once have been as civilized as the Wessex downs.

The contents of both volumes are altogether admirable, the names of authors contributing to *Oxoniensia* are alone sufficient guarantee of excellence. Major Allen's air-photographs, the finest of their kind ever taken, illustrate two of the articles. Prehistory is represented only by one article, but it is one that signalizes the essential feature of the region—crop-sites, a feature recognized by the genius of Haverfield long before the invention of aeroplanes. Mr Ralegh Radford's account of the rediscovery of the Roman Villa at Ditchley from the air and of his excavation to it is the major contribution to the volume. Major Allen's series of air-photographs of the villa (some of the best of which are reproduced) provide an almost complete synopsis of the technique of this new instrument of research. History is represented by articles on St. Frideswide and her times (Professor Stenton), covering a characteristically wide sweep of contemporary history ; on the Oxfordshire Hundreds by Miss H. M. Cam ; and on a contemporary map of the Defences of Oxford in 1644 by Messrs. Lattey, Parsons and Philip. There are also Notes and News, and Reviews. The introductory note by Dr Salter states the need of such a publication as *Oxoniensia* and makes certain good suggestions (vol. II, which appeared recently, fully maintains the high standard set).

The *Ulster Journal of Archaeology* also marks a renascence—that of a celebrated Journal which had become extinct. It is born again in a modern form. The contents cover a wide field embracing prehistoric archaeology, folk-lore and primitive customs and historical by-ways. There are Notes and Reviews. The archaeology is admirable. We hope that, as time goes on, it may be possible to turn the searchlight of archaeology on to the dark region of early Irish history, as is done by Mr Lawlor in his two contributions to this number. The outstanding feature, both of the Journal and of its background, is the scientific excavation of chambered cairns, described by Mr Estyn Evans. We hope that in due course the inhabited sites of Ulster will be similarly explored.

The format of both the journals reviewed is up-to-date and well chosen. The old tradition of size (first broken by ANTIQUITY) has been cast aside for one more suitable for an illustrated publication. The chief divisions are the same (Editorial, Articles, Notes, Reviews). The covers are good, that of *Oxoniensia*, with its contents and publisher on the outside, being much the best, though the vignette is weak. The *Ulster Journal* does not give sufficient prominence to the important fact of price, which after all is what potential subscribers want to know first. (It should be added that the price seems to us to be too

low). This information is concealed in a reprint of a preliminary circular included without pagination at the end ; and it does not (as does *Oxoniensia*) name any place or publisher on the cover. We make this criticism because we know from long experience that it is not enough to provide readers with a good well-cooked meal, as do both these journals ; the price and menu are equally important. Moreover it would be easy to correct such a small, if important, deficiency.

For the benefit of intending supporters we give this essential information here. *Oxoniensia* is published and sold by the Oxford Architectural and Historical Society at the Ashmolean Museum, Oxford. One volume is issued annually to members, the annual subscription being fifteen shillings and carrying with it all the other privileges of membership. Entrance fee, five shillings. Price of each volume to non-members, one guinea. Write to the Hon. Secretary of the Society at the Ashmolean Museum, Oxford.

The *Ulster Journal of Archaeology* is sponsored by a Committee and an Editorial Board. ' If sufficient support is forthcoming, two volumes (? parts) will be published annually '. The subscription is ten shillings a year. Intending subscribers are invited to forward ' one of the annexed forms ', but these are not available in our copy. Presumably it is sufficient to write to the Hon. Editor, Mr O. Davies, Queen's University, Belfast. We hope that these remarks will be accepted in the helpful and friendly spirit in which they are made. We wish both journals the success they so thoroughly deserve ; otherwise we should not trouble to make them. O.G.S.C.

TREASURE TROVE IN LAW AND PRACTICE from the Earliest Time to the Present Day. *By* Sir George Hill. *Oxford : the Clarendon Press*, 1936. *pp.* ix, 311. 21*s*.

Treatises on comparative law, which are not at all common, are apt to become unwieldly. By selecting a subject of strictly limited scope Sir George Hill has produced a volume of equal interest to the Lawyer and the Archaeologist. He says with great modesty that the book claims to be ' nothing more than a collection of material ' but it is the first and only comprehensive presentation of the subject, and its conclusions are both authoritative and valuable. It is almost world-wide in its scope and the labour involved in its preparation must have been prodigious. Sir George expects that no one is likely to read the book through, to which one can only reply that a reviewer, like other men, is not bound to incriminate himself.

The law of treasure trove depends in the first place upon the general theory of the law of property adopted or implied in any particular legal system, of which it forms a very small fragment. The indirect use of the law for the preservation

of antiquities is a very recent development, in fact as modern as the conscious desire to preserve antiquities as an end in itself.

We can therefore put aside archaeological preoccupations, and view the problem of treasure trove as the question of the ownership of a valuable chattel the existence of which was unknown until it happened to be found. The three claimants are the finder, the owner of the soil, and the ruler. Every system of law can be viewed as an apportionment of rights between one or more of these three. Many systems have sought to deprive the finder of any rights at all, but provisions of this kind have always failed for the obvious reason that they always led to concealment. You have first to find the finder, and then to find the treasure that he has hidden or sold.

The Roman law varied from time to time, but in obedience to its general principle, that occupation was the foundation of ownership, it generally divided the proceeds between the finder and the owner of the soil. If the find were made on public land the treasury came in for its share, but simply as owner of the soil, and not under any paramount state claim.

With the growth of feudalism the more primitive system known as the principle of regality regained possession. The king claimed title in two ways. The idea of barbarian monarchy was that treasure in the absence of any better claimant naturally belonged to the king because, for one reason, he alone could coin money. Feudalism added to this the principle that the king was the ultimate owner of the soil and that all others were his tenants, and consequently the ownership of an unknown treasure would in theory not have been granted out by the king to his tenant, but would have remained in him. The same principles are the basis of the doctrine that mines royal (*i.e.* gold and silver) belong, as they still do in England, to the king.

From the close of the Middle Ages the clue to the development of the law is a struggle between the principles of regality and those of the Roman law—an illustration, in fact, of the struggle for the reception of the Roman law in opposition to feudal principles which makes up so much of the legal history of Western Europe. The French Civil Code, for example, gives half to the finder and half to the owner of the soil, or if the finder is also the owner then he gets the whole. This is a complete victory of Roman law over the principle of regality and part of the victory of the droit écrit over the droit coutoumier which was one of the lasting results of the French Revolution.

In England, as anybody might expect, the position is a compromise, entirely illogical and eminently practical. In theory the full principle of regality still obtains, but in practice the Crown through the British Museum either returns the finds or pays the full value of those retained. The owner of the soil does not come into the picture at all, but what does he matter in these days? H. J. RANDALL.

A DICTIONARY OF ASSYRIAN CHEMISTRY AND GEOLOGY. *By* R. Campbell Thompson. *Oxford: the Clarendon Press*, 1936. *pp.* xlviii, 266. 21*s*.

Here is another example of collaboration between an Assyriologist and experts in other sciences. Oxford has already given us the fruits of collaboration in the matter of Law (Driver and Miles), in Astronomy (Langdon and Fotheringham), and now, in this volume, Dr Campbell Thompson allies his immense learning in the field of Assyriology with that of experts in the physical sciences at Oxford and elsewhere. The result is a very remarkable book; remarkable in what it attempts and in what it achieves.

The title does not convey the wealth of the contents of the volume. It is not only a dictionary but a historical dictionary; and the history is not merely Assyrian of the time of Ashurbanipal, the 7th century B.C. Assyrian king whose initiative in collecting and directing literary work has made all students of ancient Mesopotamian culture his debtors; it includes much that is earlier. Moreover it contains medical, magical and philological material drawn from many lands and cultures and languages.

The contention is startling: the Assyrians 'had a sound practical knowledge of simple chemicals'; they 'experimented with fire and acids on vegetables and minerals', and 'achieved astonishing and unexpected results', though we know little of the technical processes. The evidence is set down under such headings as: Salts, Chemical Earths, Arsenic Groups, Metals, Stones (Red, Blue, White, Green). There is an important discussion, with texts, of early glass making.

Dr Thompson would not claim certainty for all his conclusions. There is probably no argument against the chemistry and geology of the book, for the author has gone to experts in those sciences for advice. Nor is there any decisive argument, probably, against the philological comparisons with Semitic and non-Semitic words. But it is as well to follow the author's example and make liberal use of 'perhaps' and 'it might be', etc. His general contention is established: the Assyrians had the things and the experimental knowledge of the things; a knowledge attained scientifically and developed by necessities of crafts and medicine. The data set out in this book are of first importance for the 'cuneiform' specialist and for the historian of scientific achievement.

Here are a few additions to the material adduced in the book:

p. 1. Salt and fish; cp. 2/3 (*še*) *šám mun-ḫa-ú-sa-šè* (Drehem text; Orientalia 55, no. 47 : 12). Another Drehem text has the, here irrelevant, phrase: 1 shekel of silver *ḫa-mun* (Lutz, Sumerian Temple Records, part II, no. 77 : 1).

p. 2. In point of fact, salt isn't much mentioned in Ur III.

p. 15. *ELTEG.* cp. *ELTEG-qum* (Or. 55, p. 34; three Umma, Ur III, tablets) together with the ' crushed powder ' mentioned by Dr Thompson on p. 162. What is *ELTEG* in the frequent Ur III context: beer, bread, oil, onion, *ELTEG*? probably a food-stuff; impossibly an eye-wash? (the tablets all relate to people on journeys).
ELTEG. SI occurs on damaged tablet, Ur III, Umma (Analecta Orientalia, 121 : 1).

p. 46. *IM. GUŠKIN.* Add Drehem tablet (An. Orient. 7, no. 375 : 7; date broken).

p. 58. *Guškin.* Odd that gold is so rarely mentioned on the masses of Ur III tablets. One of the earliest mentions occurs on a Nippur text, recently published, not later than Agade rule, described as ' Feldmiete (?) ' (Pohl, ' Vorsargonische und Sargonische Wirtschaftstexte ', 1935; no. 51).

p. 59. *Guškin. ḪUŠ.* A; interesting and only (?) Ur III reference to red silver (*Kù ḪUŠ.* A; An. Orient. 7, no. 377 : 6, 9).

p. 61. *Guškin. SI. SA*; an earlier mention at Nuzi (Meek, OASC. 215 : 3).

p. 62 : *kù làḫ-ḫa* (cp. pre-sargonic, Pohl l.c. 78.1; 75 : 3).

p. 63. note 1 cp. Deimel, ' Wirtschaftstexte aus Fara ', nos. 30–37, and Pohl l.c. (Nippur), 71, 75 as payment for house. Remarkably frequent in early Fara and Nippur proper names. pp. 122–3, note 1 cp. 2/3 *gín kù za-gul* (on an unpublished Harvard tablet, Ur III). T. FISH.

BASKETWORK THROUGH THE AGES. *By* H. H. BOBART. *Oxford University Press*, 1936. *pp.* 174 *and* 86 *figs.* 12*s* 6*d.*

Mr Bobart has written an interesting popular book on baskets and basketwork in Ancient Egypt, Assyria and Babylon, Greece, Rome, of the Celts and Gauls, and has added Biblical references. The rest of the little book deals with what may be termed the folklore of basketry, the Basketmakers' Company, and other aspects of his subject. He has read widely and usually gives adequate references. The illustrations are apposite, but it seems unnecessary to have two of the hypothetical appearance of the wickerwork first church of Glastonbury. The sensational illustration of the ' Wickerwork of the Druids ' is superfluous seeing that the author rightly dismisses it as improbable that the British druids sacrificed human beings. The ethnological references are slight, but this is a very wide aspect which is rather outside the author's scheme. One would, however, have liked a precise reference to the harvest festival of ' the natives of Borneo '. A pleasing reference is made to Professor T. Okey, who is quoted as saying: ' All the learned lucubrations in encyclopaedias relating to the Latin *bascauda* and supported by classic quotations from Martial and Juvenal, may be dismissed on the authority of the best lexicographers '. The author says: the

' origin of the Middle-English word " basket ", like the origin of the craft, seems lost in obscurity ' ; in this as in other disputed matters his attitude is strictly impartial.

A. C. HADDON.

BARSOFF GORODOK : ein westsibirisches Graberfeld aus der jungeren Eisenzeit. *By* T. J. ARNE. *Stockholm : Kungl. Vitterhets Historie och Antikvitets*, 1936. *pp.* 96 *and* 34 *plates.*

The ancient settlement site of Barsoff Gorodok lies on the north bank of the Ob, 10 km. from Surgut. It was as long ago as 1891 that the Swedish scholar Dr Frederic Martin excavated an extensive cemetery of flat graves situated just west of the settlement, and obtained the material now fully published by Dr T. J. Arne. His work is excellently illustrated with photographs, and includes a complete inventory of the finds from all 111 excavated graves ; further sections deal with external relationships, chronology, and racial problems. Individual plans of the great majority of the graves are missing, but as grave-groups have been scrupulously kept together little of scientific importance is lost.

Relying partly on the comparatively secure dating established by Kusnetsoff in his investigations of Kurgan graves in the Tomsk neighbourhood, and to some extent on A. Spitzyn's chronological grouping for the Kama region, Dr Arne assigns the Barsoff cemetery to the late 8th–11th centuries A.D. He is able to correct Spitzyn's dating in some respects, notably by the suggestion of an earlier date for the first appearance of filigree work in the area.

The bronzes can be divided roughly into three groups based on their distribution ; the first, that includes the delightful broad flat armlets with bear designs, seems virtually to be limited to this West Siberian territory round the Ob and Irtish ; a second, which among other types numbers the elaborate ornaments with long-necked horses' heads and pendant chains, extends west of the Urals to the Kama region ; while the third finds parallels still further west, across North Central Russia north of the Volga and reaching even as far as Swedish Lappland. This last group contains pendants of half-moon form, and stylized bird-images, executed in the round, with little hanging bells. Certain bronzes, and especially an annular ornament of entwined ' dragons ', which have prototypes probably a thousand years older from the graves of Ananjino, add to the existing evidence for the long survival of Scythic traditions in Asia.

This question of survival is of great interest in another direction : no British reader can fail to be struck by the great resemblance between the Barsoff pottery and the Baltic Stone Age and Russo-Finnish wares that we have come to link with our Neolithic B ceramic ; this likeness is largely one of decoration, in form the Barsoff vessels suggest those of Fatjanovo. The same resemblances are noted by Talgren for the Ananjino pottery, but he is unwilling

to allow the possibility of any direct survival through such an immensely long period of time. Dr Arne is non-committal, but hints that as the Ananjino tradition is still persisting at Barsoff a thousand years later, could it not already have been born a thousand or so years earlier ? If such continuity can ever be proved, from Stone Age to early Medieval times, what a truly staggering example it will be of that innate conservatism of woman. J. J. HAWKES.

THE OLD TOWNS OF ENGLAND. *By* CLIVE ROUSE. *Batsford*, 1936. *pp.* 120, 129 *illustrations*, 2 *maps*. 7*s* 6*d*.

It must be a task of extreme difficulty to compress into a clear picture the vast amount of information that is available about the old towns of England. On the one hand, there is a danger of over-generalization, and on the other there is the danger of producing a portmanteau full of a jumble of facts. Mr Clive Rouse has succeeded in finding a delightful compromise. After an introductory chapter, he has made his material manageable by dividing the variety of the English town into four categories—cathedral cities ; market and country towns ; ports and harbours ; and, lastly, resorts and spas. ' Numerous overlapping exceptions ' are inevitable, but, in each chapter, the main theme is quite clear. Quite sensibly, London has been excluded ' as being too vast in scope ' for this volume.

The introductory chapter emphasizes the importance of an historical background in discussing English towns. But we might, perhaps, wish that a rather more formal treatment of town development had been given instead of the existing rambling account. That is soon forgotten. In the chapters that follow, historical detail is used again and again to make clear some feature of architecture or of plan. Full space, too, is given to the survival of traditions, ceremonies, fairs and markets. The chapter on cathedral cities, as might be expected, was not difficult to make attractive ; all the time Mr Rouse has his eye not only on the cathedral itself but upon its relation to the city as a whole. But perhaps the most lovable of all towns is the little market town where today the ' farmer's ordinary ' continues to be eaten at inns great and small. More exciting is the harbour town with its ship-chandler's shops. And what pages of history are opened by a chance old print in the window of an antique shop, showing Riverport as it was in the 1780's ! Lastly, come the English watering places whose pump-rooms and crescents and Regency terraces represent a whole phase of English life and manners. ' Bath, of course, must stand supreme amongst this group '. This chapter seems the most successful in the book, maybe because the material available is more restricted and therefore more manageable.

Nothing need be said about the technical excellence of the illustrations beyond the fact that they are up to the usual Batsford standard.

Throughout the book there is a constant plea for the safeguarding of the many treasures of the English town. As Mr Rouse is well aware, towns must ' move with the times '. But, too often, there is tragedy when the old is swept utterly away, and when evidences of the past ' are blotted out and forgotten '. We must remember that Progress and Preservation are by no means incompatible. It is one of the achievements of the Batsford books in general to have made us increasingly aware of the riches, both of country and town, to be found in these islands. And it is high praise to say that this volume does that as much as any.

H. C. DARBY.

ANCESTRAL PORTRAITURE IN ROME : and the art of the last century of the Republic. *By* DR ANNIE N. ZADOKS-JOSEPHUS JITTA. Allard Pierson Stichting Bijdragen I. *Amsterdam : Noord-Hollandsche Uitgevers-Mij*, 1932. *pp.* 119, 22 *plates. No price stated.*

This is the first publication made from the funds of a new foundation at Amsterdam University—the Allard Pierson Foundation. It has one serious defect for which the author is not responsible : nothing on the cover or the back gives the smallest indication of the contents. The back reads simply ' A.P.S.–Bijdragen I '. Since the work is a monograph, the title should take precedence in position on the back. I know that it is a common practice of Institutes in many lands to publish books under their auspices and at their expense and then suppress everything but their own name on the cover. This is an absurd practice that should stop. In effect it means that a student may take down twelve volumes of a series before he gets the one he wants.

This book is a meritorious, if rather amateurish piece of work. The author surveys Roman art of the last century of the Republic with freshness and some originality. She commences with a useful analysis of the use of masks for the dead in the Bronze Age. She collects all known instances and then does the same for the Classical period. She concludes that the use of masks in burials was an Aegean and Eastern custom imported by the Etruscans when they migrated to Italy. From them it reached the Romans. She interprets the famous passage of Polybius as meaning that the early Romans used masks of the dead persons at their funerals and placed them in the house after the ceremony. From this, as many other archaeologists have argued, came the life-like character and realism of Republican portraiture, different from the character-drawing realism of the Hellenistic portrait. Here the author is on well-known ground, though her general treatment of the subject is vigorous and gives us much additional knowledge. But she makes one contribution of great importance in clearly isolating a class of Roman Republican portrait which is demonstrably based on a *death mask* made from the corpse. Her demonstration consists of

comparisons of some of her group with known and famous death-masks, notably that of Frederic the Great. It is indisputable that death-masks all have in common certain physical characteristics, such as the sinking of the cheek and the lengthening of the space between the nose and the mouth, which invariably happens after death. These characteristics she finds, in some cases startlingly emphasized, in what are meant to be portraits of the living. Quite possibly all these years we have conceived our general impression of the strong silent Republican Roman with his ascetic and grim figure, from a study of the faces of dead Romans. No wonder we tend to attribute to the Republic qualities of Catonian sternness and asceticism. If we have based our assumptions on the portraits of dead men we shall be bitterly deceived. I always doubted the truth of the old tag that ' dead men tell no tales '. S.C.

ARABS OF CENTRAL IRAQ: their history, ethnology and physical characters. *By* HENRY FIELD, with introduction *by* SIR ARTHUR KEITH, F.R.S. Anthropological Memoirs, vol. IV. *Field Museum of Natural History, Chicago*, 1935. *pp.* 474, 156 *plates*, 48 *figures*, 3 *maps*. *Price not stated.*

Here at last is a comprehensive series of anthropological measurements of living Arabs (667) of Iraq, made by Mr Henry Field, Curator of Physical Anthropology at the Field Museum, during the winter of 1927–28 (Field Museum-Oxford University Joint Expedition to Kish). The subjects measured belong to three distinguishable groups: (a) settled agriculturalists of Kish, (b) wandering Beduin from between the Two Rivers, and (c) soldiers of local garrisons, recruited however from as far south as Basrah and as far north as Mosul, so that the results obtained have a wider connotation than the specialized area of origin would indicate. Yet the specialized area, scene of the ancient civilizations of Sumer and Babylon, could not have been better chosen for the comparison than is afforded by the data with skeletal remains recently excavated by archaeologists and ascribed to the 4th millennium B.C. The ancient inhabitant, it is of interest to note, had a much bigger head than the modern inhabitant (cranial capacity 100 ccs. bigger). The wider interest of Mr Field's work lies in the evidence it contributes to the problem of racial evolution in western Asia generally.

The central and major portion of the monograph is devoted to statistical tables (14 measurements and 23 other observations for each individual), the latter part to a set of 156 beautiful plates of Arab heads, a full-face and profile photograph of each subject, numbered to correspond with its appropriate table of measurements. Mr Field's analysis of his data is illustrated by graphs which show at a glance the whole complex of indices, both absolute and relative, for his three groups. In a lucid introduction of 74 pages, Sir Arthur Keith gives

an exposition of these faces, facts and figures. Copious charts illustrate points of similarity or difference between one or other of the Iraq groups and groups of more-or-less related Egyptians, Somalis, South Arabians, Armenoids, Dravidians (Chitrals) or Aryo-Dravidians (Pathans). With these people the Arabs are shown to have the small head and, within variable limits, the dark pigmentation in common. A large number of the Arabs have the conspicuous nasal development common in Armenoids—a wide Caucasoid feature—but the brachycephalic form of Armenoid head, characterized by flattened occiput and the ear placed conspicuously far back in the head, was found but rarely among Kish Arabs, the tendency increasing among soldiers recruited in the north. Both the settled Arabs and the visiting Beduin were found to be dolichocephalic (C.I. 75.3 and 73.4 respectively). Racially, Mr Field considers them predominantly Mediterraneans, but they are shown to be a ' highly differentiated race ' with a ' marked tendency to variability '. This, after all, is scarcely surprising in a population having so mixed a racial inheritance—Sumerian, Babylonian, Cassite, Parthian, Mongol—with a strain of negro blood, perhaps, from an old usage of slavery and concubinage. The variability, however, shows features which Sir Arthur Keith regards as having evolutionary significance. The history of the tribes, such as the sub-title of the book leads the reader to expect, is not given in this volume (IV), and indeed, it seems doubtful whether such authentic fragments as are available of a society largely unlettered, would be a factor of weight in an ethnological survey of this kind, where so little existed before. Mr Field has done well to give us the anthropometric data he has. The absence of blood-tests (in his continued expedition of 1934 he even succeeded in accomplishing some work on these lines in Baghdad and elsewhere) does not detract from this valuable work, for it must not be forgotten that his subjects were superstitious believers in the evil eye, and suspicious alike of the means and ends of the investigator. The scope and the exhaustiveness of the material makes this pioneer contribution notable. Mr Field is to be congratulated on overcoming many obstacles, and in this monograph ' makes a royal gift to his fellow workers '.

BERTRAM THOMAS.

THE HERO : a study in tradition, myth and drama. *By* LORD RAGLAN. *Methuen*, 1936. *pp.* 311. 10*s* 6*d*.

Lord Raglan is the owner of a one-track mind. In this wholly readable and well-written book he has driven his mental engine so hard along the single track that towards the end the rails seem worn to the sleepers. He is entertainingly outraged by every scholar of the last half century who has ever dared to suggest that ancient myths contain a kernel of truth. Whereas, he tells us, ' modern stories such as the *Pickwick Papers* are assumed to be fictitious unless

there is good reason to believe them historical, old stories are commonly assumed to be historical unless they can be proved to be fictitious . . . In the following pages I shall try to show that the " smoke " which arises from these oft-told tales is the outcome of mythical and not historical fires '. In other words Lord Raglan is out to debunk every personality in history for whom we have records which are not as precise as Whitaker's Almanack, Burke's Peerage or Thucydides: indeed, I doubt if he would accept even these tolerable standards of what he calls ' historicity ' (dreadful word).

The trouble began when he first placed himself in a dilemma and then found himself furiously attacking the harmless onlookers who were enjoying the spectacle of the hunter caught in his own net. For the proposition he starts with is this : all myths are based ultimately either on historical truths or on purely fictitious fabrications, made to entertain and please. If they are based on historical truths no one has yet been able to prove it : if they are based on purely fictitious fabrications they are no use to the historian. Convincing himself that the scholars of the last half century have assumed the historical background of most myths because some appear to have a kernel of truth, he proceeds to show how every known story in which a famous character is involved is based on nothing but imagination. He will have nothing whatever to do with ' race-memory ' and folk-tradition because he fails to detect any distinction between human beings and mere cattle. ' It has been held ' he says, ' that the curiosity which is displayed in some degree by all human beings is evidence of ability to speculate ; is the interest which a herd of cattle displays in a strange dog evidence of the ability to speculate ' ? Myths therefore are barely even the experimenting of imagination. They are mere mental wandering.

The view which he is opposing he summarizes thus : ' Whereas Euhemeros was content to claim that the gods had once been great men, it now seems to be generally held that such a thing as a purely mythical character has never existed '.

That, in brief is his position. He has made a complete Gleichschaltung of all mankind to one mental level ; he has assumed that all myths are believed to contain history and he decides violently that all myths are myths, and that myths are, as such, almost worthless except as entertainment. King Arthur, all the personalities in Homer, Hengist and Horsa, one and all (and many more), are to be removed from the list of people who might once have existed.

But the trouble is that he makes so rigid an antithesis in his original proposition, he generalizes so furiously, that he fails to give himself even the faintest chance of escaping the explosions of his own petards. Who said that all myths were historical ? who indeed was so foolish ? Some are based on history, others are not. Why, one can see myths growing round the lives of real people, some of whom one knew personally. Was Dr Spooner a fabric of the imagination ? does

Mr Gladstone survive only in a list of speeches invented by some latter-day Thucydides ? is George Washington only a kind of totem ? Did Oliver Cromwell ever exist ? Are Kitchener and Lawrence (like King Arthur) still alive ? and who invented Mr Lloyd George ?

Let us examine some of the mythological characters discussed here. King Arthur, admittedly one of our least promising mythological characters, whose historical quality has been attenuated almost to nothing, is now generally held by reputable historians to represent a kind of Romano-British Gunga-din, who took over local defence and used his military experience gained from the Romans to defend his country. A blameless hypothesis. And yet to Lord Raglan, Arthur survives only as a person ' whose property consists almost entirely of hills, rocks, and caves, where . . . he has to take his turn as godfather with the giants, the devil and Robin Hood '. By means of the same arguments Lord Raglan would deny any historical existence to Alexander the Great (whom I am surprised to see is not dealt with at length) and Oliver Cromwell. Yet the Alexander myths are far more widespread than the Arthur myths and I can show Lord Raglan mounds, caves and rocks attributed to Iskander Beg, ranging from Albania to Turkestan—geographically not far wrong as a distribution-map of his activities. But, because for Alexander we have Arrian and other written sources, he believes in his existence, while because for Arthur we have nothing comparable, he denies it. He cannot bring himself to believe that there really is often a difference between legendary characters like the Devil, and legendary characters like Priam and Agamemnon and Arthur and Alexander. It is all because he assumes that people cannot turn into legends, just because legends (like the Devil or Old King Cole) cannot conceivably turn into people.

Among the casualties I had expected to find King Minos of Crete, surely as preposterous a myth as was ever invented, and one in which even the Greeks did not believe. I suspect it is omitted because the author feels a lurking suspicion that there may be some truth in it. After all a large palace, a city to hold many thousands of citizens, bulls and labyrinths, all unfortunately dug up by archaeologists and quite visible to the eye, might faintly suggest that there was once a King Minos, or something sufficiently like one to upset his theory. So of Minos not a word. Instead, just to please the classical scholars he denies the ' historicity ' of the Dorian Invasion. ' There are ' he says, ' no facts to travesty. There is no reason to believe that the Dorians represent a later invasion . . . The story of the Dorian conquest was invented by the scholars to justify them in believing in the historicity of Homer, and this although the story receives confirmation neither from Homer nor from any other classical source '. Alas, poor Yorick, this is just sheer nonsense. A visit to a dozen Peloponnesian sites would cure Lord Raglan of his sad scepticism. Archaeologists are the

most sceptical of all people. They are prepared to admit, even to Lord Raglan, that there is no kind of proof that Achaeans ever sacked Troy. But they are prepared to declare without ambiguity that Troy was sacked at a date when Homer believed to it have fallen, and that someone invaded Greece and ruined the Bronze Age World at a time when legend stated that the Dorian Invasion took place. But Lord Raglan is not in the least interested in archaeological facts. For that reason his book, though clear, incisive and determined, is I am sorry to say quite unacceptable to serious students, except in so far as it gives a well-needed jar to any of them who may be prepared to accept as sober history all the idle tales of later romancers. For them it will be salutary. For the archaeologist it is unnecessary. STANLEY CASSON.

THE KING'S ENGLAND: KENT. *Edited by* ARTHUR MEE. *Hodder and Stoughton*, 1936. *pp.* XII, 506, 226 *plates.* 10*s* 6*d.*

This ' New Domesday Book of 10,000 Towns and Villages ', of which the second volume is devoted to Kent, is likely to have a varied welcome, and it will either appeal cordially to the reader or else leave him in a state of apathetic indifference. Its aim is to describe at first hand and in alphabetical order a very large number of places, making in the Editor's words a ' unique picture of our countryside as it has come down through the ages, a census of all that is enduring and worthy of record '. In some measure it succeeds in fulfilling its purpose, but only too often a critical reader's idea of worthiness will not coincide with the Editor's. Here one must not look for documentation. The style is free, and its effect is gained by the use of familiar journalistic tricks rather than from the serious use of an historical background. For this reason, the compilers never quite succeed in gaining the confidence of a reader who wants something more than a mere travel-book.

Among the two hundred pictures are some of great merit as, for instance, the St. George fresco at Dartford, but many suffer badly from over-reduction. There is a tendency to include too much, a case in point being the twelfth century carving of St. Marcial at Bobbing, where the essential part of the picture is not as large as two postage stamps.

In a future edition, mention might be made of a few more prehistoric field antiquities. The hill-fort at Oldbury, Bigbury Rings, the lynchet cultivations on Godmersham Downs, the Roman road in Cobham Park, the magnificent untouched stretch along Barham Downs where there is also a cluster of Saxon grave mounds, the Bronze Age mounds on the cliffs at Ringwould, the barrows at Stowting and Shepherdswell, are all of general interest to the sightseer and easily accessible. At the same time, the inns of Kent, which here come off very badly, might be given their just due. R. F. JESSUP.

THE CLEAR MIRROR : a pattern of life in Goa and in Indian Tibet. *By* G. E. HUTCHINSON. *pp.* 171. *Cambridge University Press*, 1936. 8*s* 6*d*.

This is rather a curious book, and one difficult to classify. The author is by profession a biologist, and was attached to the Yale North India Expedition of 1932, under the leadership of Dr H. de Terra. In these three essays he attempts to portray not the scientific observations which he made, but the totality of impressions which impinged upon his senses at different points on his travels. It is within this totality that a ' pattern of life ' is perceived. In the first essay, rather oddly entitled ' Spain at Sea ', the author gathers up the emotional experiences of his journey eastwards, culminating in the mystery and beauty which he discerned amidst the Catholic shrines and Eastern temples of Goa. The second title, ' Painting on a Fan ', once more evokes an image quite different from that presented by the text. The fan in question is one of the vast flattened semi-cones of alluvium which afford sites for settlement and for innumerable terraced rice-fields in the upper valley of the Indus. The note of colour is here supplied by the cataracts of blue turquoise which decorate the heads and shoulders of the Tibetan women : strangeness and mystery are added by the dances and processions of the lamas. The third essay, ' Lakes in the Desert ', is perhaps the most interesting from the purely objective standpoint. It describes the peculiar and complex rhythms of life in the layered waters of the saline lakes, and in the snow-fed streams which flow beneath a burning sun. Even in this remote plateau-region ancient rock-inscriptions reveal alien cultural influences, while the profile and movements of the antelope *Pantholops* bring to the author's mind the old legend of the Virgin and the Unicorn which every medieval Bestiary used to tell afresh.

Gifted with a mind sensitive to beauty, and possessing a peculiar freshness and simplicity of outlook, Mr Hutchinson has written a book of unusual charm, and has succeeded in creating not only for himself but for his readers ' worlds of form replacing ill-spelt names on a map '. E. G. R. TAYLOR.

GLASS FROM IRAN IN THE NATIONAL MUSEUM, STOCKHOLM. *By* CARL JOHAN LAMM. *Stockholm : C. E. Fritzes K. Hovbokh ; London : Kegan Paul. pp.* 22, *and* 48 *plates.* 10*s* 6*d*.

The Swedish National Museum has recently been fortunate enough to acquire a representative collection of glass of medieval times made in Iran by Mr A. Hannibal, and the present volume is, in effect, a short general account of medieval Persian glass based on the material in that collection. Dr Lamm is at pains to insist that though some of the glasses in the Hannibal collection, especially many of the undecorated specimens, were probably made in Persia itself, there is every reason to suppose that others were manufactured either in

Syria or in Egypt and imported thence to their find-spots in Iran. There is, as he points out, a very great difficulty in deciding the place of origin of individual glasses of this period found in Near Eastern countries. The result is that this book, illustrated as it is with line-drawings of the principal varieties in the collection, and in addition with photographic reproductions of the better preserved pieces, must form an indispensable reference-book of the types and decorative motives of Near Eastern glass of the medieval period, from about the 5th to the 14th centuries A.D. Considering its handy size, the book will be especially useful to field-workers on Arabic sites.

Dr Lamm's competence to deal with the subject in question was long ago proved by the appearance of his epoch-making work, *Mittelalterliche Gläser und Steinschnittarbeiten aus dem Nahen Osten* (1930, 2 v.). The present volume forms in many respects a necessary appendix to that work, for, as he himself remarks with regret, he was unable to inspect the Hannibal collection while *Mittelalterliche Gläser* was writing, and so perforce had to omit it from consideration at that time.

The introductory pages give, in a clear and concise fashion, a general description of the pieces in the collection on the basis of technique and decoration. It is perhaps a pity that a more detailed account of shapes and fabrics, including a statement of the basic colour of each piece, was not given, though the former can to a great extent be inferred from the admirably clear line-drawings and diagrams on plates 9–48, and the author has already described most of the latter in his *Mittelalterliche Gläser*. The book is written in English which, as we would expect from Dr Lamm, is almost faultless, and the printing and format are pleasing and adequate. One or two misquotations which were noted in the bibliography are misprints, and do not mar the scholarship of the volume as a whole.

D. B. HARDEN.